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TRAINING ANALYSIS AND EVALUATION GROUP

TECHNICAL REPORT NO. 110

AN ASSESSMENT OF THE NAVY CURRICULUM AND INSTRUCTIONAL STANDARDS OFFICE (CISO)

OCTOBER 1981

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TRAINING ANALYSIS AND EVALUATION GROUP
ORLANDO, FLORIDA 32813

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AN ASSESSMENT OF THE NAVY CURRICULUM AND INSTRUCTIONAL STANDARDS OFFICE (CISO)

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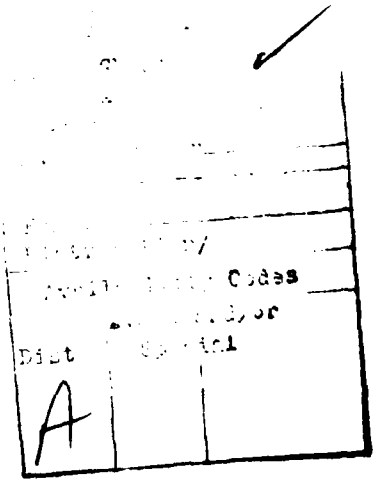

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Within the Naval Education and Training Command, Curriculum and Instructional Standards Offices (CISOs) are responsible for training quality assurance at local training activities. This study evaluated the CISO concept and its implementation. While the concept is basically sound, it has not been well implemented. Consequently, recommendations were developed for improving the operations of CISOs and for increasing their contributions to training quality assurance.

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SUMMARY OF THE STUDY

The Chief of Naval Education and Training (CNET) in 1975 directed the establishment at local training activities of Curriculum and Instructional Standards Offices (CISOs). These offices were established to maintain the quality of local training by accomplishing a variety of training development, instructional support, and training evaluation functions. Additional resources were not provided the schools to implement the CISO concept.

Recent concerns over the ability of CISOs to perform effectively in their assigned roles resulted in a request by Chief of Naval Technical Training (CNTECHTRA) Code N63 for a study of the CISO concept. Subsequently, the Training Analysis and Evaluation Group (TAEG) was tasked by CNET to perform the study. The CNET tasking requested TAEG to: (1) evaluate the CISO concept and its implementation and (2) develop options/recommendations, as warranted, for accomplishing required training development, instructional support, and training evaluation functions.

To accomplish the study objectives, the TAEG collected a variety of information through visits to and questionnaires sent to the Naval Education and Training Command (NAVEDTRACOM) CISOs. Information collected concerned current CISO organizations and operations, personnel capabilities, and problems encountered. Visits to Army and Air Force activities were also made to determine how these services accomplish functions comparable to those expected of Navy CISOs.

The work performed led to the conclusion that the CISO concept is basically sound. A number of positive features and benefits for training are associated with the notion of an office within a local training activity that is specifically charged with responsibility for assuring training quality. However, the CISO concept has not been well implemented within the Command. Curriculum and Instructional Standards Offices across the NAVEDTRACOM are highly variable organizationally and in terms of the functions they perform. The potential effectiveness of these offices is limited by a lack of manpower (both numbers and types of skills required) for performing quality assurance functions and by various other factors that affect the utilization of CISO personnel at the local training activities.

Two sets of recommendations for overcoming current problems and improving CISO contributions to training quality assurance were developed. The first set concerns the total CISO concept. These recommendations, presented in section VII of this report, are provided in the form of a charter for CISO operations. Specific recommendations concern the following areas:

- functions that are appropriate for CISO staff to perform
- organization and staffing of CISOs
- interfaces between local CISOs and CNTECHTRA
- mechanisms for ensuring the performance of training quality assurance functions at local command levels.

The second set of recommendations, presented in section VIII, concerns discrete, separate actions that could be taken to assist generally the cause of enhancing the quality of local training. They are:

1. Develop a short course covering purposes, principles, and procedures of Instructional Systems Development (ISD) and require that at least all officers reporting to training command billets complete the course.

2. Develop a handbook for use of CISO personnel to provide guidance/instructions concerning tasks assigned to them. This handbook should contain information such as how to conduct task analyses, develop tests, requirements and procedures for instructor evaluation. In addition to providing guidance, the handbook should also identify sources where more detailed information on specific topics can be found.

3. Develop standardized courses in training quality assurance areas. These courses could be used for training CISO personnel. They could also be used by CISOs for inservice training of other locally assigned personnel.

4. Rewrite instructions governing CISOs. Currently, several CNET and CNTECHTRA instructions assign tasks to CISOs. It is recommended that these taskings be appropriately consolidated and that one instruction, with cross references as necessary, be written and promulgated for CISO guidance.

5. Establish a direct interface between CNTECHTRA and local CISOs for defined purposes. It is specifically recommended that CNTECHTRA N63 be appropriately tasked, staffed, and funded to:

- maintain direct cognizance over local CISO operations
- assist local CISOs in resolving problems and obtaining resources or training needed to perform assigned work.

6. Establish proficiency billets for military personnel to be assigned to CISOs.

SECTION I

INTRODUCTION

Chief of Naval Education and Training (CNET) Instruction 1540.6 (1975) required the establishment at CNET training activities of Curriculum and Instructional Standards Offices (CISOs). These offices were assigned responsibility for accomplishing a variety of functions related to promoting the quality of training given at local levels. These functions fall generally within three broad areas: training development, instructional support, and training evaluation. Additional resources were not provided to the schools for compliance with the instruction.

Recently, questions have arisen at CNET and CNET Functional Command levels concerning CISOs' organizational and personnel capabilities for performing assigned functions. In view of these concerns, CNET, at the request of the Chief of Naval Technical Training (CNTECHTRA), Code N63, tasked the TAEG to conduct a study of the CISO concept.

PURPOSE

The purposes of this study were to:

- evaluate the CISO concept and its implementation within the NAVEDTRACOM
- develop options/recommendations (as warranted) for more effective future accomplishment of these functions.

ORGANIZATION OF THE REPORT

The remainder of this report is contained in seven sections and four appendices. Section II provides detailed information about the CISO concept. The requirements established for CISOs by various higher authority instructions are presented, and interfaces between local schoolhouse CISOs and other CNET activities are described. The technical approach of the study is given in section III. The procedures and instruments used to obtain information about current CISO operations are described. Procedures used for developing alternatives to the CISO concept and for developing recommendations for the future operation of these offices are also described in section III. The results of the CISO evaluation are presented and discussed in sections IV and V. Section IV presents the results obtained from questionnaires. Section V presents the results of interviews with local training activity personnel. A number of alternatives to the current CISO concept as a means of assuring the quality of Navy training are presented in section VI. Section VII presents a proposed charter for CISO operations. The final section of the report, section VIII, presents recommendations.

Appendix A lists the functions that CISOs are currently expected to perform. A copy of the questionnaire package used to obtain information about CISO operations is contained in appendix B. Information concerning the performance by the Army and Air Force of training functions comparable

to those expected of Navy CISOs is presented in appendix C. Appendix D contains technical notes concerning the statistical treatment of data obtained from the questionnaires used in the study.

SECTION II

THE CURRICULUM AND INSTRUCTIONAL STANDARDS OFFICE (CISO) CONCEPT

This section describes the Navy CISO concept. Instructions relevant to CISOs are reviewed. Interfaces between local CISOs and other NAVEDTRACOM activities are also described.

BASIC INSTRUCTIONS

Two key instructions discussed below established and implemented the CISO concept within the NAVEDTRACOM.

CNET INSTRUCTION 1540.6. CNET Instruction 1540.6 directed the establishment of CISOs at training activities. This organizational concept was implemented to perform curriculum development and appraisal functions more effectively. The CISO concept was defined as a subsystem because it was designed to function within the systems approach to training. The instruction provided that the CISOs "... will function as an integral component of the activity they serve and not as an extension of higher authority."

Curriculum and Instructional Standards Offices were charged to maintain quality assurance of training within prescribed standards through review of curricula and documentation, classroom monitoring, guidance, inspection, maintenance of publications and training aids, and instructor and staff inservice training programs. They were also assigned responsibility for maintaining local testing programs within prescribed standards through performing functions such as construction and validation of tests and analysis of test data. Other functions assigned included collecting, processing, evaluating, and reporting feedback data regarding training quality using questionnaires, student critiques, structured interviews.

The CNET instruction further provided that the CISOs be headed by a special assistant reporting to the commanding officer of the training activity. Curriculum and Instructional Standards Offices were to be administratively separate from the instructional departments but provide them technical assistance in accomplishing quality training. Two branches--an Evaluation Branch and a Curriculum and Training Support Branch--were specified for a typical CISO organization.

Evaluation Branch responsibilities include maintaining item banks for preparing examinations for use by the instructional departments, statistical analyses of test data for use in training evaluation and test item improvement, internal and external feedback, developing proposals for short-and long-term evaluation projects, and student critique programs. Responsibilities of the Curriculum and Training Support Branch include task analysis, curriculum development, monitoring classroom instruction, instructor in-service training, monitoring procurement of training devices, developing training aids, and maintaining a central technical library. The CNET instruction (1540.6) which established the CISO concept at the local levels, however, specifically noted that additional manpower would not be assigned to training activities to implement the concept.

CNTECHTRA INSTRUCTION 1540.40. Chief of Naval Technical Training Instruction 1540.40 (1979)[1] formally implemented the CISO concept within CNTECHTRA training activities. This instruction is also used for guidance by Commander, Training Command, U.S. Atlantic Fleet (COMTRALANT) and Commander, Training Command, U.S. Pacific Fleet (COMTRAPAC) activities.

CNTECHTRA Instruction 1540.40 prescribes the organization, responsibilities, and duties of CISOs. Functions assigned are essentially the same as those identified in the parent CNET instruction (1540.6). Three representative CISO organizations are described in CNTECHTRA Instruction 1540.40 and training activities are identified for which one of the three organizations was considered appropriate. Types of personnel considered appropriate to perform the various CISO functions were also identified.

OTHER INSTRUCTIONS

Other CNET instructions also place requirements on local CISOs. These are reviewed briefly below.

CNET INSTRUCTION 1550.15. CNET Instruction 1550.15 (1980) defines policy and establishes general guidance relating to Instructional Program Development Centers (IPDCs). The instruction defines an Instructional Program Manager (IPM) as "the agent authorized and responsible for the execution of a developed instructional program." It provides (paragraph 4a(2)) opportunity for the CISO, as an extension of the IPM, to become actively involved in the instructional program development (IPD) process in a number of "minimum areas." These include:

- participating in developing and implementing validation and evaluation plans and processes
- acquiring and maintaining statistical data for IPD-developed courses
- providing inputs to and/or participating in preliminary IPD Project Plan Workshops
- functioning in a consultant and/or advisory role throughout the entire IPD process
- identifying and documenting revision requirements after implementing an IPD-developed course.

CNET INSTRUCTION 1550.15A. CNET Instruction 1550.15A (draft), if approved, will cancel CNET Instruction 1550.15. The draft instruction (1550.15A) describes procedures to be used for curriculum development projects assigned to IPDCs. Paragraph 3c of the draft instruction provides for the establishment of an IPD project team to guide each assigned project through

[1]CISO functions were previously prescribed in an enclosure to CNTECHTRA Instruction 5453.1B.

the first three ISD phases of analysis, design, and development. Members of the IPD project team will include a "...Curriculum and Instructional Standards Office (CISO) representative (or equivalent) and a representative of the implementing school(s)." The responsibilities of the CISO representative (paragraph 4b(1(b)) will be to:

- provide data, information, and materials for existing training as required
- participate in developing/conducting validation and evaluation plans.

CNET INSTRUCTION 1550.1B. CNET Instruction 1550.1B (draft) also has indirect implications for local CISO duties and responsibilities. This draft instruction assigns responsibilities to the CNET Functional Commands for applying ISD procedures to selected classes of courses. Requirements for CISOs are not directly stated. However, consonant with the requirements established for CISOs by the basic CNET and CNTECHTRA instructions, these offices will likely be heavily involved in applying ISD procedures to local training.

CNET INSTRUCTION 1540.3B. CNET Instruction 1540.3B (1981) has implications for local CISO functions, duties, and, especially, staffing. The instruction requires that Functional Commanders ensure that the capability for evaluating and interpreting training appraisal system (TAS) findings exists at each training activity. Normally, this capability would be resident within a local CISO. Accordingly, compliance with this instruction has implications for the type of talent that should be available within that office.

CISO INTERFACES WITH HIGHER AUTHORITY

The basic instructions governing CISOs assert that these offices are an integral part of the activity which they serve and not agents of higher authority. Consequently, direct tasking of a CISO is the prerogative of the local commanding officer only since he has overall responsibility for the quality of training given at his command. However, the importance to training quality of the functions assigned to CISOs cannot be denied. Consequently, the activities and achievements of these offices are of interest to a number of higher command agencies. Interfaces between local CISOs and higher levels of the NAVEDTRACOM are discussed below. These interfaces are manifest in various ways; e.g., vested interests in high quality training, commonality of functions performed at the different command levels, and provision of advice/support to local CISOs.

CNTECHTRA INTERFACES. CISO activities and achievements are of most direct interest to CNTECHTRA N63 and to CNTECHTRA Training Program Coordinators (TPCs).

CNTECHTRA N63. The most direct link between local CISOs and CNTECHTRA staff is with the CNTECHTRA Instructional Systems Development, Training Standards and Academic Liaison Branch (N63). The N63 code is assigned broad responsibilities for developing, supervising, and coordinating of training programs,

particularly with respect to curriculum and instructional standards and evaluation. The duties and responsibilities of N63 (formerly 016) as related to CISOs are set forth in CNTECHTRA Staff Instruction 5400.2D. They include:

- planning, implementing, and managing the application of curriculum and instructional standards within the Technical Training Command (TECHTRACOM)
- planning, developing, and coordinating the qualitative evaluation requirements of technical training programs and courses
- planning, coordinating, and managing the process of instructional systems development within the TECHTRACOM and directing its application to current and future training programs and courses.

Thus, N63 is concerned with many of the same functions that CISOs perform at local training activities. N63 is also designated formally as the TECHTRACOM interface with CISOs within the command. This group has recently initiated workshops for CISO staffs which are aimed at providing assistance and upgrading skills for personnel assigned to local training activities. Other recent initiatives on behalf of CISO personnel include preparing and disseminating a newsletter to keep CISO staffs informed on matters that are relevant to their interests.

Training Program Coordinators. Training Program Coordinators functioning within several staff codes at CNTECHTRA also interface with local CISO personnel. The nature of this interface is not formally prescribed. However, TPCs exercise general supervision at command level over matters pertaining to particular courses. The usual case is that TPCs work directly with the local school staff rather than with the CISO personnel who support those local school staffs. However, direct contact between TPCs and CISOs may occur in various areas such as for curriculum approval or revision.

CNET INTERFACES. Interfaces between CISOs and CNET staff functions exist indirectly by way of a shared interest in training quality. The activities of CISOs are of interest to several CNET staff codes even though there are no formally established direct links between CNET and local CISOs. CNET staff functions having most interest in CISOs are identified below.

CNET 00A2, Special Assistant for Education and Training Audits and Technical Assistance. The CNET Special Assistant for Education and Training Audits and Technical Assistance serves as a primary liaison between CNET headquarters and field activities. The duties of this office include obtaining and providing information to the CNET and his Principal Civilian Advisor concerning the status of instruction and instructional support at the school level. Interactions with local CISOs are required for this purpose.

CNET 015, Special Assistant for Training Appraisal. The CNET Special Assistant for Training Appraisal is responsible for collecting and

disseminating training feedback information obtained from sources external to the NAVEDTRACOM. Although local training activities may no longer collect training feedback from fleet sources, they participate in the command's TAS program. Specifically, local training activities prepare task statements for use on NAVEDTRACOM TAS Level II questionnaires. These questionnaire items are based on learning objectives of a course in question. CNET 015 also sends local training activities summary data reflecting areas where schoolhouse training was judged by graduates' fleet supervisors to be inadequate. Local schoolhouses are required to interpret the meaning of observed deficiencies, assess the action implications of these deficiencies, and initiate appropriate corrective action. These external evaluation tasks fall within the responsibilities assigned to CISOs.

CNET N2, Recruit and Specialized Training Operations. The CNET Assistant Chief of Staff (ACOS) for Recruit and Specialized Training Operations (N2) serves as the primary point of contact for CNET-sponsored training. Code N2 monitors and assures the quality of NAVEDTRACOM training. This function is accomplished largely through interactions with appropriate TPCs. CISO operations as they affect training quality are of direct interest to this group.

CNET N5, Research, Development, Test and Evaluation. The activities of CNET N5 (Research, Development, Test and Evaluation) are not strongly related to local CISO activities. However, this code is concerned with instructional innovations and implementing improved training techniques within the NAVEDTRACOM. Disseminating information to CISOs who are responsible for maintaining familiarity with instructional technology improvements may assist CISOs to improve training at local levels.

CNET N9, Training Systems Management. The ACOS for Training Systems Management (N9) advises and acts for CNET on all matters pertaining to acquiring, developing, evaluating, and maintaining training systems including training devices, training equipment, curriculum, and other instructional materials. The N9 code is responsible for implementing and/or assuring the ISD approach is used within the NAVEDTRACOM. This ACOS may interface directly with local CISOs in developing training to be conducted at local activities (see CNET Instruction 1550.15) or indirectly when courses are developed using ISD at local levels.

Instructional Program Development Centers which function in various locations under the cognizance of CNET N9 will increasingly interface with local CISO staff for developing training. Two way interfaces exist with CISO representatives supporting the IPDCs in developing courses for which the IPDC is responsible and, conversely, with IPDCs supporting the local activity in training development for which the Functional Commanders have responsibility.

SUMMARY STATEMENT

The review presented above indicates clearly that much is expected of local CISOs--offices which were created within the framework of currently available manpower. How well CISOs perform their duties and how well the

functions identified for ensuring a high level of training quality are performed at the local level are of direct concern not only to the NAVEDTRACOM but to the Navy at large. Such concerns led directly to the request for the present study to evaluate the CISO concept and to develop alternatives/recommendations (as needed) for establishing and maintaining the quality of technical training.

SECTION III

TECHNICAL APPROACH

This section presents the technical approach used to obtain and process information for evaluating the CISO concept. The approach used to develop recommendations/options for accomplishing training development, instructional support, training evaluation, and related functions is also discussed. Frequently, throughout this report these functions are grouped under the term, "Training Quality Assurance."

EVALUATION OF THE CISO CONCEPT

A major objective of the study involved an evaluation of the CISO concept and its current implementation within the NAVEDTRACOM. To satisfy this objective, a variety of information concerning benefits associated with the CISO concept, functions performed by local CISOs, staff capabilities, and problems encountered by these offices was required. Necessary information was obtained for the most part through a survey of NAVEDTRACOM CISOs.

CISO SURVEY. As a first step in the study program, a list of functions which CISOs are currently expected to perform was compiled from applicable CNET and CNTECHTRA instructions. The list was reviewed by CNET and CNTECHTRA staff at orientation conferences conducted by TAEG at each headquarters at the beginning of the program. Both staffs were requested to suggest additional functions that they thought CISOs should perform as well as delete any they felt CISOs should not do. The resulting list of functions is presented in appendix A.

A subset of functions was selected from the overall list and used as a basis for surveying current CISO operations and local commands' attitudes toward the CISO concept. Information concerning CISO operations, command attitudes towards training quality assurance, and CISO capabilities for performing the functions was obtained through questionnaires and visits to training activities.

Questionnaires. Two different questionnaire forms were developed for collecting data concerning CISOs:

1. a short form which was used to obtain information from commanding officers/executive officers, CIS officers, and training department heads

2. a long form which was used with all personnel currently filling CISO billets/positions at the local commands.

The short form consisted of three sections. The first section asked the respondents to rank 11 general training support functions in terms of importance to training quality. The second section asked respondents to give their preference concerning where primary responsibility for accomplishing these functions should lie. The third section asked for ratings of the CISO concept and of the performance of the local CISO.

The long form consisted of five sections. The first asked for information about the respondents; e.g., position, grade, rate or rank, time in position, and educational background. The second section addressed the order of importance of increases in various resources available to CISOs, and the usefulness of short courses or seminars in various topics related to training quality assurance. The third section dealt with the frequency and content of communications, both within the CISO and between CISO personnel and personnel in other activities. Sections IV and V listed 24 functions chosen to represent all the functions on the longer list that CISOs are expected to perform. Questions asked concerned the degree of involvement with the functions, frequency of performance, and amount of effort expended. Questions were also asked concerning the impact on training quality of eliminating those functions.

Appendix B contains a sample questionnaire package consisting of a transmittal letter and both short and long forms. These packages were either transmitted by mail or hand-carried to activities visited. Questionnaire packages were distributed to 30 NAVEDTRACOM CISOs.

Visits. In addition to the information obtained via questionnaires, a variety of other information concerning CISO organizations and operations was obtained through visits to selected training activities. Twenty CISOs were visited. Interviews were conducted with local CIS officers, key CISO staff, and various other local command personnel (e.g., commanding and executive officers, training department or school heads). Questions asked concerned:

- formal and informal CISO group structure
- interrelationships with other local departments and non-local agencies and commands
- tasking lines
- authorized manning (numbers and types of skills)
- local internal and external evaluation efforts/programs
- CISO-type functions performed locally by individuals not assigned to the CISO
- resources available to local CISOs
- resources needed for effective functioning.

In addition, candid discussions were held with local CISO staffs concerning the functions they actually perform and factors which limit their ability to perform effectively. Topics discussed included the local command's attitudes towards training quality assurance, resource problems, collateral duties assigned CISOs, and a variety of other related matters. Also, discussions were held concerning the type of organization(s) and support that local CISO staff felt would be most helpful in performing their jobs. Organization

charts and command instructions affecting CISOs were also collected from the local activities.

Data Processing and Analysis. For processing and managing necessary data sets and for statistical analysis of data obtained from the questionnaires, the Statistical Package for the Social Sciences (SPSS) software package (Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975; Hull and Nie, 1979) was used. Information obtained from visits, local instructions, and organizational charts was reduced through content analysis.

DEVELOPING RECOMMENDATIONS/OPTIONS FOR QUALITY ASSURANCE

The second objective of the study concerned developing recommendations/options for more effective future accomplishment of training quality assurance functions. Alternatives to the CISO concept and recommendations for CISO operations were developed on the basis of TAEG professional judgment. This judgment was aided by a variety of inputs from various sources. These included:

- opinions expressed by CNET and CNTECHTRA staffs and local CISO and other local command personnel concerning what CISOs should or should not do and how they should be organized and staffed
- results obtained from the CISO survey concerning current CISO operations, functions performed, personnel capabilities, training needs, and problems that should be overcome to promote the effectiveness of training at the local level
- practices employed by the Army and Air Force to establish and maintain the quality of their training.

Information concerning how the other services accomplish functions similar to those expected of NAVEDTRACOM CISOs was obtained from visits made to Army and Air Force headquarters and several field units. Information obtained from interviews with other services' staffs and by study of printed materials provided by Army and Air Force activities is presented in appendix C. The practices of these services significantly influenced the thinking of the TAEG project staff with respect to forming recommendations for future Navy quality assurance practices. Consequently, careful reading of this appendix is recommended.

SECTION IV

RESULTS AND DISCUSSION OF CISO EVALUATION: QUESTIONNAIRES AND ORGANIZATION CHARTS

This section presents and discusses the results obtained from the questionnaire portion of the CISO survey and from the analysis of CISO organization charts. A summary of the results is presented first. This is followed by detailed discussions. Readers not interested in the details of data analysis may obtain the basic information from the summary and proceed directly to section V.

SUMMARY OF QUESTIONNAIRE FINDINGS

A nontechnical summary of the major questionnaire findings is presented below:

1. Commanding or executive officers, training department heads, and CIS officers as a group (n=134) rated 11 general training functions in terms of their contribution to maintaining training quality. The six most important functions were, in descending order, curriculum development, curriculum revision, instructor training, internal evaluation, test development and revision, and instructor evaluation.

2. The same respondents clearly prefer that the six most important functions be done locally by training departments and CISOs, not by outside activities (e.g., IPDCs or higher commands).

3. Both commanding or executive officers and CIS officers were generally satisfied with the CISO concept and its implementation. However, training department heads rated CISOs significantly lower than commmanding or executive officers and CIS officers. Training department heads were not entirely satisfied with the CISO concept and its implementation.

4. There are five groups of functions with which CISO personnel report similar degrees of involvement. These groups of functions may represent major job types. Each individual tends to report the same degree of involvement for all functions within a group. The first of these five groups of functions (CISWRK) comprises five working CIS functions: reviewing documentation, task analysis, curriculum development, course design and revision, and developing training aids. The second group (EVAL1) includes nine evaluation functions concerning student testing, internal and external feedback, attrition, setbacks, and student critiques. The third (CISDEV) is composed of developmental curriculum and instructional support functions such as monitoring developments in training technology, selecting instructional delivery systems, developing and conducting inservice, evaluating inservice programs, and conducting special research projects. The fourth group (EVAL2) consists of evaluating instructors and conducting annual course reviews. The last group of functions (TECLIB) consists of one function, that of maintaining a central technical library.

5. The mean degree of involvement with three groups of functions (CISDEV, EVAL2, and TECLIB) differs significantly among CISOs. This is evidence that CISOs actually operate differently (i.e, do different things) and have different levels of involvement in functions.

6. There are six clusters (or types) of CISOs based on their degree of involvement in three function groups (CISDEV, EVAL2, and TECLIB). The clusters are shown in table 6, page 36. CISOs within a cluster tend to do the same things to the same degree.

7. The six clusters also show significant differences in the mean ratings received from commanding or executive officers, CIS officers, and training department heads. The most highly rated cluster of CISOs shows a high degree of involvement with three groups of functions, CISDEV, EVAL2, and TECLIB (see 4 on previous page). Personnel in the CISOs in this cluster report that they have spent more time attending military management seminars. The lowest rated cluster of CISOs shows less involvement with CISDEV and EVAL2 functions and shows a high proportion of personnel with bachelor's degrees and a higher proportion of officers.

8. CISOs vary with respect to the number of functions they perform. The number of functions that CISOs report no involvement with ranges from 0 (i.e., they are involved with all functions) to 12 (i.e., they only do half the functions listed). The number of functions that CISOs are involved with has no relationship to the ratings received.

9. There is a core of about 10 functions that every CISO reports some involvement with. These 10 include reviewing course documentation, developing curricula, designing courses, developing training aids, monitoring developments in training technology, preparing examinations, developing internal feedback programs, evaluating instructors, conducting annual course reviews, and conducting special research projects. Five or more CISOs report no involvement with task analysis, maintaining a central technical library, maintaining a test item bank, and coordinating interservice training requirements.

10. It was not possible to determine exactly how many actual CISO billets there were in the NAVEDTRACOM. Numbers of personnel changed from week to week, according to CIS officers. Transient personnel might be assigned to CISO billets for varying periods of time, or several personnel might share one CISO billet over a period of time.

11. Over 80 percent of the CISOs are staff units within local training activities; the remainder are line units. The typical CIS officer reports to the executive officer. Some CIS officers report to positions one or two levels below the executive officer. CISOs usually have two branches, although several have only one and a few offices have three or four. Approximately 35 percent of the CIS officers are also either directors of training or training department heads. Also, about 20 percent of the CIS officers are civilian. Finally, the typical rank for a CIS officer is O-4, although they range from O-2 to O-6.

12. CISO personnel were 29 percent civilian education or training specialists, 12 percent military instructors or curriculum writers, and the remainder were in miscellaneous categories. Military officers were 25 percent of the respondents; 38 percent were enlisted; and 35 percent were civilians.

13. More than half of the CISO personnel had at least a bachelor's degree. About 30 percent had post-graduate degrees, mostly in education or social science. For those people with training in education, the weakest (in terms of amount of training) areas were tests and measurement, and evaluation.

14. The two most important resource areas in which CISOs could be augmented concern numbers of personnel and the skill and training of personnel.

15. The most useful short courses or seminars for CISO personnel would be in curriculum writing, course evaluation, instructional design, and test development.

16. Six variables show moderate relationships with the ratings that CISOs received as indicated by correlational analyses. The proportion of personnel who communicate with the Deputy CIS officer concerning technical issues is positively related to rating. The proportion of CISO personnel who receive tasking from outside the CISO and the proportion of personnel who communicate with CNTECHTRA concerning administrative issues are both negatively related to CISO ratings. Also, the higher the degree of involvement and the greater the frequency of involvement with CISDEV (see 4, page 21) functions, the higher the rating received. Greater frequency of involvement with CISWRK functions (see 4, page 21) was also related to higher ratings. These findings may be interpreted as follows:

- CISO personnel should be primarily responsible to the CIS officer rather than to other local command personnel.
- The CISO should be primarily involved in performing duties that require expertise in educational technology rather than performing general administrative duties.
- CISO personnel should be frequently involved in performing training development (i.e., course/module design) functions.
- The CISO should have primary responsibility for performing functions such as designing and selecting instructional delivery systems, conducting appropriate inservice training for assigned staff (e.g., in ISD procedures), evaluating training department inservice programs, and conducting special research projects.

17. None of the various evaluation function scales had any direct relationship with CISO rating. However, EVAL2 (see 4, page 21) did have an indirect relationship to rating through curriculum and instructional support functions. Thus, the evaluation function performed by the CISOs is important.

The remainder of this section presents detailed information concerning the treatment of questionnaire data.

QUESTIONNAIRE FINDINGS

The major findings of the questionnaire portion of the CISO survey are presented and discussed below.

QUESTIONNAIRE RETURN STATISTICS. A total of 377 questionnaires (both short and long forms) were distributed to 30 CISOs. Of these, 23 were returned as surplus (i.e., not needed for number of personnel assigned) and 254 were usable, giving an overall response rate of 72 percent. Table 1 provides summary statistics for the questionnaire effort. Table 2 shows participation in the survey by activity.

TABLE 1. OVERALL SUMMARY: QUESTIONNAIRE SURVEY

QUESTIONNAIRE DISTR UTION

Started 29 Sep 1980
Last mailout 29 Oct 1980
Stopped accepting returns 19 Dec 1980

SURVEY STATISTICS

Number of CISOs surveyed:	30
Number of quesitonnaires distributed:	377
Total number of returns:	288
Number of usable returns:	254
Number returned as surplus:	23
Return rate (usable):	72 percent

RETURN RATES BY GROUP

CO/XO (28 out of 30)	93 percent
CIS Officer (27 out of 30)	90 percent
Training Dept Heads (79 out of 98)	81 percent
Other CISO personnel (120 out of 203)	59 percent

MAJOR FINDINGS: SHORT FORM QUESTIONNAIRE. The major findings from the short form questionnaire pertain to the importance of general training support functions, who should perform those functions, and the perceived effectiveness of CISOs.

Training Support Functions. Eleven general training support functions were rank ordered by commanding or executive officers, CIS officers, and training department heads. Ranks were assigned on the basis of the perceived importance of the function to assure training quality. The average ranks given to each of the functions by each group are shown in table 3. The rankings are

TABLE 2. CISO STUDY PARTICIPATION BY ACTIVITY

ACTIVITY	QUESTIONNAIRES DISTRIBUTED	NUMBER OF USABLE RETURNS	PERCENT USABLE RETURNS
NATTC MEMPHIS*	26	17	65
SERVSCOLCOM Orlando*	20	6	30
NAVGMSCOL Dam Neck*	5	5	100
FLECOMBATRACEN Dam Neck*	18	12	67
FLETRACEN Norfolk*	22	15	68
FLEASWTRACENLANT Norfolk*	10	9	90
NAVPHIBSCOL Little Creek*	8	5	63
SWOSCOLCOM Newport*	5	3	60
NETC Newport*	11	9	82
NAVJUSTSCOL Newport*	5	0	0
NAVDIVESALVTRACEN Panama City*	7	4	57
NAVTECHTRACEN Corry Station*	8	5	63
NAVSUBSCOL New London*	10	8	80
NATTC Lakehurst	15	9	60
NAVSCOLCECOFF Pt Hueneme	4	3	75
SERVSCOLCOM DET Chanute AFB	5	5	100
FLEASWTRACENPAC San Diego*	25	21	84
NAVSUBTRACENPAC Pearl Harbor	15	13	87
NAVSCOLEOD Indian Head	10	9	90
SERVSCOLCOM San Diego*	16	16	100
SERVSCOLCOM Great Lakes*	18	10	56
NAVSCOLTRANSMAN Oakland	2	2	100
NAVDAMCONTRACEN Philadelphia*	7	5	71
NAVTECHTRACEN Meridian	9	6	67
FLECOMBATRACEN San Diego	8	6	75
SUBTRAFAC San Diego	10	8	80
NAVTECHTRACEN Treasure Island*	11	10	91
COMBATSYSTECHSCOL Mare Island*	8	7	88
NAVPHIBSCOL Coronado	9	9	100
NAMTRAGRU Memphis*	27	17	63
Totals	354	254	72**

* Indicates personal visits.

**This figure is the overall usable return rate computed as the number of usable returns divided by the total number of questionnaires distributed minus the number returned as surplus. The average return rate per school was approximately 74 percent.

TABLE 3. RANKINGS OF 11 TRAINING SUPPORT FUNCTIONS

Respondents were asked to rank order the functions below in terms of importance to assure training quality, using a 1 for the most important function, a 2 for the next, and so on.

FUNCTION	RESPONDENTS		
	Commanding or Executive Officers (n=28)	CIS Officers (n=27)	Training Department Heads (n=79)
1. Curriculum development	1	1	1
2. Curriculum revision	2	2	3
3. Instructor training	4	6	2
4. Internal evaluation	3	3	4
5. External evaluation	10	8	10
6. Test development and revision	6	5	5
7. Guidance and counseling of instructors	7	9	9
8. Standardization	8	7	6
9. Instructor evaluation	5	4	7
10. Administrative support of training command	11	11	8
11. Ensure appropriate use of evaluation results	9	10	11

based on the means of the priorities assigned to each function by the three groups. For example, the mean of all ranks given to curriculum development by commanding or executive officers was lower than the mean for any other function ranked by this group. Therefore, curriculum development was given a rank of 1, indicating that commanding or executive officers, on the average, considered it more important to assure training quality than other functions.

The ranks in table 3 reflect the relative order of importance to training quality that the three groups of respondents assigned to these training support functions. The rank order correlations (Kendall, 1962) among the three sets of ratings are quite high, ranging from 0.81 to 0.93, indicating substantial agreement among the respondents on the order of importance of the 11 functions.

Assignment of Functions. Respondents were also asked to indicate their order of preference for which of five activities should have primary responsibility for the 11 training support functions. The orders of preference are shown in table 4 for the six most highly rated functions. For all six functions, the training department and the CISO are the first and second choices, respectively, of the 134 respondents. These first two choices are actually ranked quite closely, while CNTECHTRA is a relatively distant third choice. Thus, commanding or executive officers, training department heads and CIS officers clearly prefer local responsibility for the accomplishment of these six functions.

TABLE 4. MEAN PREFERRED ORDER OF PRIMARY RESPONSIBILITY FOR FUNCTIONS

	CISO	Training Department	CNET	CNTECHTRA	IPDC
Curriculum development	2	1	5	3	4
Curriculum revision	2	1	5	3	4
Instructor training	2	1	4	3	5
Internal evaluation	2	1	4	3	5
Test development and revision	2	1	5	3	4
Instructor evaluation	2	1	4	3	5

Average difference in mean rank between CISO and TD: 0.5
Average difference in mean rank between CISO and CNTECHTRA: 2.1

Ratings of CISOs. Ratings of CISOs were obtained with four items in the small questionnaire. These items concerned satisfaction with the CISO concept, positive contributions that the CISO makes, overall effectiveness of the CISO, and the impact eliminating the CISO would have on the quality of training. The internal consistency reliability (Nunnally, 1978) of the four items was 0.90, which is quite high and indicates the four items should be taken together as an overall index of rating. Thus, further analysis of CISO ratings was performed using the mean of the four rating items as a more accurate estimate of CISO performance.

The next step in the analysis of CISO ratings consisted of determining what differences and similarities there were among the ratings of CISOs from the three different sources (i.e., commanding or executive officers, CIS officers and training department heads). Analysis of variance, using rating as the predicted variable and type of respondent as the predictor, did show significant differences among ratings from the three sources ($F = 16.46$, $p < .0001$). Based on Scheffe's (1959) method of simultaneous multiple comparisons, training department heads rated CISOs significantly lower than did either commanding or executive officers and CIS officers ($p. < .01$ for both comparisons). The difference between ratings from commanding or executive officers, and CIS officers was not significant and was in fact quite small.

Even though the absolute levels of ratings were different for training department heads, it remained to be seen whether or not the rank orders of CISO ratings were similar for all three groups of respondents. Kendall's (1962) coefficient of concordance was 0.49 for the three sources of judgment and for the 22 CISOs on which there was complete rating information. The coefficient of concordance, which can range in value from 0 to 1, indicates agreement among a set of judges. A value of 0 would indicate no agreement, while a value of 1 would indicate perfect agreement. Thus, there is moderate agreement among the three types of respondents about the rank orders of CISOs. Accordingly, the mean rating of each CISO across all three groups of respondents is a more accurate estimate of CISO performance than the rating received from any one group.

The final step in checking the quality of the CISO rating scale involved determining the extent to which the scale reflected something about the CISO itself rather than simply reflecting the random views of individual respondents. This aspect of the rating scale would be indicated by significant differences among CISO ratings (Borgatta and Jackson, 1980). An analysis of variance using ratings from all three types of respondents as the dependent variable and CISO as the independent variable was performed. There were significant differences among the CISOs ($F = 1.72$, $p < .03$) indicating that it is appropriate to average ratings from all three types of respondents to get an overall rating that reflects a true CISO characteristic.

While the reliability of the composite scale of items used to represent ratings of CISOs can be estimated, the validity of the rating scale cannot. There is no external criterion for CISO performance that can be used to check the validity of the rating scale. However, evidence indicates that the scale is internally consistent, that the three different sources of

ratings agree, and that the rating scale is measuring a true characteristic of CISOs and not merely reflecting random individual perceptions. Therefore, it is reasonable to assume that the rating scale is a valid indicator of CISO performance. Given that assumption, the ratings of CISOs will be used as a criterion in further analysis of the data. Also, certain general statements can be made about the current performance of CISOs.

Ratings that CISOs received ranged from 2.4 to 4.9 with a mean of 3.3, indicating that some CISOs are performing unsatisfactorily while others are doing an outstanding job. Apparently, there is room for improvement in implementing the CISO concept.

MAJOR FINDINGS: LONG FORM QUESTIONNAIRE. The major findings from the long form questionnaire are presented and discussed below. These discussions concern the characteristics of current CISO personnel, and the types of functions CISOs perform. Evidence is also presented for the existence of different types of CISOs.

Characteristics of CISO Personnel. Of the CISO personnel who responded to the questionnaire, 29 percent were civilian education specialists or training specialists; 12 percent were military instructors or curriculum writers (NEC 9502 or 9506). The remainder represented a number of diverse occupational specialties. Military officers constituted 25 percent of the respondents; 38 percent were enlisted personnel; 35 percent were civilians, and 2 percent did not identify themselves.

Only 12 percent of the respondents had less than a high school diploma. The median level of education was a bachelor's degree, while about 30 percent held post graduate degrees. Of those with bachelor's degrees, 37 percent were in education and 27 percent were in social science. Of those with graduate degrees, over 50 percent were in education. Of the people who reported either university or military training in various aspects of education, tests and measurement and evaluation were the weakest areas, perhaps indicating a need for increasing training in these areas or for hiring personnel who have stronger backgrounds in these areas.

Approximately 60 percent of the respondents reported that they had attended IT school; the typical amount of time spent in instructor training was reported as 4 weeks. About 48 percent of the respondents attended military management seminars and about 40 percent attended training seminars.

Of the five resource areas that respondents ordered in terms of priority, number of personnel and skill and training of personnel were ranked higher than available materials, equipment, or money.

Types of Functions. Several statistical analyses were performed to determine if there are patterns of functions which CISOs perform and the nature of their involvement with these functions. The statistical procedures used for this determination are described, and the specific numerical results obtained, are presented in appendix D. The general results are presented below.

The statistical analyses indicated that five groups of functions are homogeneous in terms of degree of involvement reported by CISO personnel. That is, within each group of functions, individuals report similar degrees of involvement. The five groups of functions derived from the analyses are shown in table 5. These five groups may be interpreted to represent general task groups or jobs which CISOs perform.

CISWRK is the name attached to the first group of functions shown in Part I of table 5, since these functions primarily involved routine work in curriculum and instructional support areas. Nine evaluation functions are labeled EVAL1. CISDEV labels a group of five functions that are concerned primarily with long term developmental activities. EVAL2 comprises two evaluation functions. The fifth "group," TECLIB, contains only one function, that of maintaining the central technical library.

The function groups were used to form five function scales. The procedures used and the psychometric properties of these function scales are presented in appendix D. The five scales were used to represent degree of involvement with general groups of functions. These five degree of involvement scales were then used to determine if there are different types of CISOs in terms of their degree of involvement with the five groups of functions. Statistical analyses (see appendix D) resulted in the six clusters of CISOs shown in table 6.

Types of CISOs. Three of the involvement with functions scales, CISDEV, EVAL2, and TECLIB, show significant differences across CISOs. Thus, these three scales were used to determine if there are different types of CISOs. It is already apparent that CISOs vary considerably with respect both to what they do and how well they do it. However, there may not be 29 or 30 distinctly different CISOs. Instead, there may be a more limited number of types of CISOs. Statistical analysis (see appendix D) showed six distinct types of CISOs. These types or clusters of CISOs are shown in table 7.

Clusters I and II are similar in terms of the EVAL2 and the TECLIB functions but cluster I is relatively higher on CISDEV than cluster II. Both I and II are equivalent to clusters III and IV in terms of EVAL2, but I and II show less involvement with the TECLIB function than do III and IV. Additionally, III and IV are similar in terms of the EVAL2 and CISDEV functions, but VI is higher than V on the TECLIB function. With this typology of CISOs established, it remains to determine what other characteristics are shared by CISOs within each of the six clusters.

The six types of CISOs do not differ significantly in terms of involvement with the functions represented by the scales CISWRK and EVAL1. All six types score rather close to the scale mid-point. This probably indicates that CISOs are spread rather evenly in terms of involvement with these two groups of functions. The remaining three involvement scales, CISDEV, EVAL2, and TECLIB, do show significant differences among the six types of CISOs. However, this is to be expected since these scales were used to establish the typology.

TABLE 5. COMPONENTS OF FUNCTION SCALES

PART I. INVOLVEMENT SCALES

Check the response that best describes your involvement with each function listed.

(1) Not involved
(2) Monitor those who do it
(3) Advise those who do it
(4) Participate in performance
(5) Supervise those who do it
(6) Do it alone

CISWRK	-	Review course and curricula data and documentation Do task analysis Develop curricula Design/revise courses/curricula Develop training materials/aids
EVAL1	-	Prepare examinations Analyze test data Maintain test item bank Develop internal feedback instruments/procedures Develop items for external feedback instruments Analyze and interpret feedback data Study attrition Study setbacks Administer student critique program
CISDEV	-	Monitor developments in training technology to recommend improvements in training Select instructional delivery systems Develop/conduct inservice training Evaluate training department inservice programs Conduct special research projects
EVAL2	-	Evaluate instructors, including contract instructors Conduct annual course review
TECLIB	-	Maintain central technical library

TABLE 5. COMPONENTS OF FUNCTION SCALES (continued)

PART II. FREQUENCY OF PERFORMANCE SCALES

On the average, how often do you perform each function?

(1) Daily
(2) Weekly
(3) Monthly
(4) Every 3 months
(5) Every 6 months
(6) Yearly or less

CSWRKB -	Review course and curricula data and documentation
	Do task analysis
	Develop curricula
	Design/revise courses/curricula
	Develop training materials/aids
EVAL1B -	Prepare examinations
	Analyze test data
	Maintain test item bank
	Develop internal feedback instruments/procedures
	Develop items for external feedback instruments
	Analyze and interpret feedback data
	Study attrition
	Study setbacks
	Administer student critique program
CSDEVB -	Monitor developments in training technology to recommend improvements in training
	Select instructional delivery systems
	Develop/conduct inservice training
	Evaluate training department inservice programs
	Conduct special research projects
EVAL2B -	Evaluate instructors, including contract instructors
	Conduct annual course review
TCLIBB -	Maintain central technical library

TABLE 5. COMPONENTS OF FUNCTION SCALES (continued)

PART III. AMOUNT OF EFFORT SCALES

For the functions you are involved with, check the response that best describes the amount of effort you put in.

(1) A very slight amount
(2) A slight amount
(3) A moderate amount
(4) A considerable amount
(5) A great amount

CSWRKC -	Review course and curricula data and documentation Do task analysis Develop curricula Design/revise courses/curricula Develop training materials/aids
EVAL1C -	Prepare examinations Analyze test data Maintain test item bank Develop internal feedback instruments/procedures Develop items for external feedback instruments Analyze and interpret feedback data Study attrition Study setbacks Administer student critique program
CSDEVC -	Monitor developments in training technology to recommend improvements in training Select instructional delivery systems Develop/conduct inservice training Evaluate training department inservice programs Conduct special research projects
EVAL2C -	Evaluate instructors, including contract instructors Conduct annual course review
TCL1BC -	Maintain central technical library

TABLE 5. COMPONENTS OF FUNCTION SCALES (continued)

PART IV. IMPACT OF ELIMINATION SCALES

For each function with which you are involved, how much impact would there be on the quality of courses if this function were no longer performed by CISO personnel?

(1) No impact
(2) Little impact
(3) Some impact
(4) Considerable impact
(5) A great deal of impact

CSWKVD -	Review course and curricula data and documentation Do task analysis Develop curricula Design/revise courses/curricula Develop training materials/aids
EVL1VD -	Prepare examinations Analyze test data Maintain test item bank Develop internal feedback instruments/procedures Develop items for external feedback instruments Analyze and interpret feedback data Study attrition Study setbacks Administer student critique program
CSDVVD-	Monitor developments in training technology to recommend improvements in training Select instructional delivery systems Develop/conduct inservice training Evaluate training department inservice programs Conduct special research projects
EVL2VD-	Evaluate instructors, including contract instructors Conduct annual course review
TCLIBD -	Maintain central technical library

TABLE 5. COMPONENTS OF FUNCTION SCALES (continued)

PART V. POSITIVE/NEGATIVE IMPACT SCALE

Would the impact of the elimination of this function be positive or negative?

(1) Positive
(2) Negative

CSWKVE	-	Review course and curricula data and documentation Do task analysis Develop curricula Design/revise courses/curricula Develop training materials/aids
EVL1VE	-	Prepare examinations Analyze test data Maintain test item bank Develop internal feedback instruments/procedures Develop items for external feedback instruments Analyze and interpret feedback data Study attrition Study setbacks Administer student critique program
CSDVVE	-	Monitor developments in training technology to recommend improvements in training Select instructional delivery systems Develop/conduct inservice training Evaluate training department inservice programs Conduct special research projects
EVL2VE	-	Evaluate instructors, including contract instructors Conduct annual course review
TCLIBE	-	Maintain central technical library

TABLE 6. COMPOSITION OF CLUSTERS

CLUSTER I	-	NAVGMSCOL	DAM NECK
		NAVTECHTRACEN	CORRY STATION
		NAVTECHTRACEN	MERIDIAN
		FLECOMBATRACEN	SAN DIEGO
		COMBATSYSTECHSCOL	MARE ISLAND
		NAVPHIBSCOL	CORONADO
CLUSTER II	-	NATTC	LAKEHURST
		FLEASWTRACENPAC	SAN DIEGO
		NAVSUBTRACENPAC	PEARL HARBOR
		NAVSCOLEOD	INDIAN HEAD
		SERVSCOLCOM	SAN DIEGO
		SUBTRAFAC	SAN DIEGO
CLUSTER III	-	NAVPHIBSCOL	LITTLE CREEK
		NETC	NEWPORT
		SERVCOLCOM	GREAT LAKES
		NAVDAMCONTRACEN	PHILADELPHIA
CLUSTER IV	-	NAVDIVESALVTRACEN	PANAMA CITY
		NAVSCOLCECOFF	PT. HUENEME
		SERVSCOLCOM DET	CHANUTE AFB
		NAVSCOLTRANSMAN	OAKLAND
CLUSTER V	-	NATTC	MEMPHIS
		FLETRACEN	NORFOLK
		SWOSCOL	NEWPORT
		NAVSUBSCOL	NEW LONDON
		NAMTRAGRU	MEMPHIS
CLUSTER VI	-	SERVSCOLCOM	ORLANDO
		FLECOMBATRACEN	DAM NECK
		FLEASWTRACENLANT	NORFOLK
		NAVTECHTRACEN	TREASURE ISLAND

Since the list of functions is identical for all questions asked about performance, the same groupings of functions were retained for questions B and C in section IV and questions D and E of section V of the long questionnaire (appendix B). This allows for direct comparisons among the five groups of functions and the six types of CISOs for the frequency of performance (Part II, table 5), the impact of elimination (Part IV, table 5), and the positive or negative aspect of elimination (Part V, table 5). The discriminating variables, CSWRKB through TCLIBE (shown in table 7), are explained in Parts II through V of table 5.

Table 7 shows the relative ranks of the six clusters of CISOs on the function scales and other variables that differentiate among the CISOs. A '+' indicates that the cluster is relatively high on the variable; a '0' indicates that the cluster is medium, and a '-' indicates that a cluster is low. For example, clusters I and IV are relatively high on the CISDEV function scale, while cluster VI is low and clusters II, III, and V are medium.

Other variables from the questionnaire are also displayed in table 7. Clusters I and III are high in the percent of personnel with undergraduate degrees in social science or technical or scientific subjects. Cluster II is high in the percent of senior enlisted personnel (E6-E9) assigned to CISO, while cluster I is high in civilians (GS9-GS13), and cluster III is high in percent of officers. The relative positions of CISO clusters on the other variables can be determined by examining table 7.

The clusters or types of CISOs can be given labels that reflect their nature relative to each other. For example, the CISOs in cluster I are relatively heavily involved in developmental curriculum and instructional support functions (CISDEV), and frequently perform working curriculum and instructional support functions (CSWRKB) and evaluation functions (EVAL2B). The personnel in cluster I CISOs tend to be relatively highly educated civilians. CISOs in cluster II are also frequently involved in working CIS functions, but their personnel have less education and are more likely to be enlisted military.

Cluster III CISOs are most notable for their degree of involvement with maintaining a central technical library; they report relatively infrequent involvement with both curriculum and instructional support and evaluation functions. These CISOs have a higher percentage of officers and assigned personnel have higher levels of education.

Cluster IV reports the deepest degree of involvement with the most functions. Also, these CISOs report frequent involvement with the developmental CIS functions. These CISOs have personnel who are relatively highly educated and who have attended military management seminars to a greater extent then have other CIS personnel.

Cluster V CISOs are distinguished primarily by the large numbers of courses serviced and by number of personnel, as indicated by number of respondents. These personnel also report greater attendance at military

TABLE 7. VARIABLES THAT DISCRIMINATE AMONG THE SIX TYPES OF CISOs

DISCRIMINATING VARIABLES	CLUSTERS					
	I	II	III	IV	V	VI
CISDEV	+	0	0	+	0	-
EVAL2	0	0	0	+	-	-
TECLIB	-	-	+	+	-	+
CSWRKB	+	+	-	0	+	-
CSDEVB	+	-	-	+	0	-
EVAL2B	+	0	-	-	-	-
TECLIB	-	-	0	0	0	+
CSDEVC	0	-	-	+	-	-
TCLIBD	-	-	0	0	0	+
TCLIBE	0	-	0	+	-	+
BA IN SOCIAL SCIENCE	+	0	+	0	-	0
BA IN TECH/SCIENCE	+	0	+	0	-	0
% OF OFFICERS	0	-	+	0	-	0
% of SENIOR ENLISTED	-	+	-	-	0	-
% GS9-GS13	+	-	0	0	0	0
LEVEL OF EDUCATION	+	-	+	+	0	0
MILITARY MGMT SEMINARS	0	0	-	+	+	0
# OF COURSES SERVICED	0	0	0	-	+	0
RATING	$0_{(3)}$	$0_{(4)}$	$-_{(6)}$	$+_{(1)}$	$+_{(2)}$	$-_{(5)}$
MEAN # OF RESPONDENTS/CISO	2.7	7.7	4.0	1.5	9.4	4.5

management seminars and relatively frequent performance of working CIS functions (CSWRKB). CISOs in cluster VI report higher involvement with the library but low involvement with all other functions.

In summary, there are different types of CISOs. Evidence suggests that there are six types that differ in terms of functions performed and in terms of personnel characteristics.

Ratings of Clusters. The mean ratings, from commanding or executive officers, CIS officers and training department heads, of the CISO clusters (shown in the row labeled "Rating" in table 7) differ significantly based on an ANOVA ($F = 2.6$, $p < .05$). Clusters IV and V have the highest rating, clusters I and II have medium ratings, and clusters III and VI have relatively low ratings. The order of the clusters, in terms of mean rating, is indicated by the figures in parentheses in the ratings columns. However, some of the differences in means are quite small. For example, clusters I and II differ by less than 0.001, so it is not appropriate to say that cluster I is better than cluster II. But cluster IV, the highest rated, does appear to be considerably higher than cluster III, the lowest rated. Therefore, it may be instructive to compare the profiles of extreme clusters to look for characteristics that may be related to the differences in ratings received.

A quick glance shows that cluster IV has more +'s and fewer -'s than cluster III. However, that is also true when IV is compared to V, the second highest rated cluster. There are some characteristics that IV and V share but that III does not. For example, cluster III is low on the frequency of performance of CSWRKB and CSDEVB functions while clusters IV and V are high or medium. Also, clusters IV and V are high on the number of hours personnel have spent attending military management seminars, while cluster III is low. Finally, cluster IV contains the smallest CISOs, both in terms of number of respondents and reported number of courses serviced, while cluster V contains the largest CISOs. Thus, one might say that it is best to be a very large CISO, perhaps because they have a valuable flexibility in allocating personnel and resources, or to be a very small CISO, perhaps because they can establish close working relationships with schoolhouse personnel.

Several general statements can be made about CISOs at this point. First, there do appear to be six distinct types of CISOs that vary on a variety of variables, including rated effectiveness. Second, the rated effectiveness of these clusters of CISOs appears to be related to several discriminating characteristics. It may be that the deliberate manipulation of some of these characteristics could result in improving the effectiveness of CISOs in the less highly rated clusters.

Involvement With Functions. The 29 CISOs surveyed differ in their level of involvement with functions. They also differ in terms of the number of functions that they do/do not perform. Table 8 presents a list of training activities and the numbers of functions that CIS personnel report no involvement with at all. If an activity does not appear in the table, then at least one person in the CISO reported at least minimal involvement (i.e., monitor those who do it) with all of the 24 functions. Thus, this is an extremely conservative estimate of lack of CISO involvement with functions

TABLE 8. NUMBER OF FUNCTIONS NOT PERFORMED BY CISOs

NUMBER OF FUNCTIONS	CISOs
3	SERVSCOLCOM Orlando
4	FLEASWTRACEN Norfolk
12	NAVPHIBSCOL Little Creek
6	SWOSCOL Newport
1	NAVDIVESALVTRACEN Panama City
1	NAVTECHTRACEN Corry Station
1	NAVSCOLCECOFF Pt Hueneme
2	NAVSUBTRACENPAC Pearl Harbor
2	NAVSCOLEOD Indian Head
4	NAVSCOLTRANSMAN Oakland
5	NAVDAMCONTRACEN Philadelphia
2	FLECOMBATRACEN San Diego
6	SUBTRAFAC San Diego
1	NAVTECHTRACEN Treasure Island
2	COMBATSYSTECHSCOL Mare Island
1	NAVPHIBSCOL Coronado

specified in instructions. The number of functions with which a CISO is not involved ranges from 12 to 0. Additionally, no significant relationship exists between the number of functions that a CISO is not involved with and the rating that a CISO received from commanding or executive officers, CIS officers, and training department heads.

Numbers of functions not performed by particular CISOs indicate the variability in the current implementation of the CISO concept. The numbers of CISOs that are not involved with particular functions may indicate the relative importance of the various functions. Table 9 displays the 24 functions under consideration and the number of CISOs (out of the 28 for which data are complete) reporting no involvement with those functions. Again, the criterion for involvement was that at least one person in the CISO reported at least the minimum degree of involvement. Out of the 24 functions, there are only five with which all CISOs report some degree of involvement. Further, there are six functions with which at least four CISOs report no involvement whatsoever.

In summary, when one examines the picture of functions that CISOs do and do not perform, the most striking conclusion is that CISOs are implemented in various ways. There may be no single best way to implement the CISO concept across all training activities. While there may be a core of functions that is desirable for all CISOs to perform, some flexibility in the means used to achieve those functions may be desirable.

The variation in the considered importance of certain functions is also reflected in the numbers of CISOs that report little or no expected impact from eliminating a particular function (table 10). The criterion used was that every respondent in a CISO reported little or no expected impact from eliminating each function, a very conservative decision rule. Using this criterion, only six functions on the list were considered necessary by at least one respondent in all the CISOs. Again, the point can be made that all 24 of these functions are probably not necessary for every CISO to perform, although there is a core of functions that is universally necessary.

PREDICTORS OF RATINGS. The final phase of analysis examined the relationships between ratings of CISOs and various predictors for the 28 CISOs for which data are complete. The predictors were all those available that showed statistical evidence that they represented true CISO-level characteristics. Only variables that did differ significantly among schools were used, since it is only these variables that could be related to CISO ratings in a meaningful way (Borgatta and Jackson, 1980).

Six of the variables showed moderate relationships with CISO rating, with correlations ranging from 0.3 to 0.5 in magnitude. Three of the variables that predict CISO ratings are concerned with degree of involvement and frequency of involvement with functions. These three variables, CISDEV, CSWRKB, and CSDEVB, are explained in table 5, page 31. As shown in table 11, their relationships with rating are all positive. The remaining three variables that predict rating are concerned with patterns and content of communication for CISO personnel. These variables are all based on items from section III of the large questionnaire (see appendix B).

TABLE 9. NUMBER OF CISOs NOT INVOLVED WITH FUNCTIONS

FUNCTIONS	NUMBER OF CISOS NOT INVOLVED
Review course and curricula data and documentation	0
Do task analysis	5
Develop curricula	0
Design/devise courses/curricula	0
Develop training aids/materials	0
Monitor developments in training technology	1
Select instructional delivery systems	3
Develop/conduct inservice training	2
Maintain central technical library	5
Prepare examinations	1
Analyze test data	2
Maintain test item bank	7
Develop internal feedack instruments/procedures	1
Develop items for external feedback instruments	2
Analyze and interpret feedback data	2
Study attrition	4
Study setbacks	3
Administer student critique program	2
Evaluate instructors, including contract instructors	1
Evaluate training department inservice programs	2
Conduct annual course reviews	0
Conduct special research projects	1
Coordinate interservice training requirements	5
Coordinate interdepartmental training activities	4

TABLE 10. NUMBER OF CISOs REPORTING LITTLE OR NO IMPACT OF ELIMINATION OF FUNCTIONS

FUNCTIONS	NUMBER OF CISOS
Review course and curricula data and documentation	0
Do task analysis	5
Develop curricula	0
Design/devise courses/curricula	0
Develop training aids/materials	3
Monitor developments in training technology	2
Select instructional delivery systems	2
Develop/conduct in-service training	1
Maintain central technical library	6
Prepare examinations	1
Analyze test data	0
Maintain test item bank	3
Develop internal evaluation instruments/procedures	1
Develop items for external feedback instruments	3
Analyze and interpret feedback data	0
Study attrition	4
Study setbacks	4
Administer student critique program	4
Evaluate instructors, including contract instructors	1
Evaluate training department in-service programs	3
Conduct annual course reviews	0
Conduct special research projects	2
Coordinate interservice training requirements	3
Coordinate interdepartmental training activities	1

TABLE 11. BEST PREDICTORS OF CISO RATING

SCALE	
DEPTEC (+)	Proportion of CIS personnel communicating with Deputy CIS officer concerning technical issues
TASKIN (-)	Proportion of CIS personnel who receive tasking from outside the CISO
CNADMN (-)	Proportion of CIS personnel who communicate with CNTECHTRA concerning administrative issues
CISDEV (+)	Degree of involvement with developmental curriculum and instructional support functions
CSWRKB (+)	Frequency of involvement with working curriculum and instructional support functions
CSDEVB (+)	Frequency of involvement with developmental curriculum ard instructional support functions

DEPTEC represents the proportion of CISO personnel who communicate with the Deputy CIS officer concerning technical issues; it is positively related to CISO ratings. TASKIN represents the proportion of CISO personnel who receive tasking from outside the CISO; it is negatively related to CISO rating. That is, as more CISO personnel receive tasking from outside the CISO, the lower that office's rating is likely to be. CNADMN represents the proportion of CISO personnel who communicate with CNTECHTRA concerning administrative issues; it is also negatively related to CISO rating.

There appears to be a coherent picture in the six variables that predict CISO ratings. First, those CISOs that use the deputy CIS officer, or the senior education specialist, as a source of professional technical information and advice, tend to receive higher ratings. This is indicated by the positive relationship between DEPTEC and the CISO ratings. Further, this relationship supports the view that the principal contribution the CISO has to make to local training activities is as the repository of skills and knowledge concerning educational technology. It can also be argued that this should be the principal contribution that the CISO makes to the local training command. This is evidenced by the negative relationships between TASKIN and ratings and between CNADMN and ratings. Thus, CISO personnel should be responsible primarily to the CIS officer, not to other personnel. They should involve themselves with CISO duties that reflect their expertise in educational technology and should not become bogged down in general administrative duties.

In addition to addressing optional lines of authority and communication, it is also possible to describe the general types of functions with which CISOs should be involved. Both degree of involvement with and frequency of involvement with the developmental curriculum and instructional support functions (see CISDEV in table 5 for a list of those functions) are positively related to CISO ratings. Therefore, some effort in CISOs should probably be directed toward these developmental functions.

Frequency of involvement with working curriculum and instructional support functions (see CISWRK in table 5 for a list of those functions) is also positively related to rating. Therefore, frequent involvement in performing these functions is desirable. However, the degree of involvement should be moderate and probably should consist primarily of advice and assistance.

None of the various evaluation scales showed any significant relationships with CISO ratings. However, EVAL2 (see table 5) did show a strong relationship with CISDEV, which is positively related to rating. Thus, there appears to be a multivariate relationship among CISDEV, EVAL2, and rating. Path analysis (Kenny, 1979) was used to explore possible relationships among these three variables. The results of the path analysis are shown in figure 1. The arrows indicate the expected directions of effect. Thus, both CISDEV and EVAL2 lead to or have an impact on the ratings that CISOs receive, but CISDEV and EVAL2 only vary together. That is, as one goes up or down, so does the other, but there is no necessary cause and effect relationship between them. The numbers by the arrows in figure 1 are standardized path coefficients and may be interpreted similarly to correlation coefficients. Values may range from -1 to +1 and the magnitude of

the coefficient indicates the strength of the relationship while the sign indicates the direction.

Based on the path diagram in figure 1, CISDEV has a moderate positive impact on rating, while EVAL2 has a very small negative impact on rating. However, even though the direct impact of EVAL2 on rating is negligible, the indirect impact through CISDEV is appreciable. There is some logic to this interpretation. There is no reason to expect the performance of evaluation functions to have any direct impact on ratings. Evaluation, in and of itself, does not cause any improvement. It is only when information obtained from evaluation is acted on that any contributions are made to accomplishing local training goals. Thus, even though evaluation functions do not impact directly on CISO ratings, there does appear to be an indirect, but nonetheless important, relationship between evaluation and ratings.

ORGANIZATIONAL CHARACTERISTICS OF CISOs

Organizational characteristics of local CISOs examined during the study included CISO size (i.e., number of personnel) and the formal relationship of the CISO to the local training activity. These results are based on both questionnaire data and on the analysis of organization charts obtained from CISOs.

Size. Size is typically one of the most straightforward organizational characteristics to measure. However, in the case of CISO, size was difficult to determine. Billets are often not designated as CISO billets but merely as curriculum writers. Additionally, one CISO billet may be rotated among several personnel over a period of time. In other cases, transient personnel may be assigned to CISO billets for various periods of time. Also, non-CISO personnel may perform CISO functions. Thus, a meaningful assessment of size was not possible.

Formal Organization of CISOs. To assess other organizational characteristics of CISOs, the organization charts obtained from each training activity and information obtained during visits to CISOs were used. From these, it was possible to determine six organizational characteristics of CISOs:

- whether the office served a line or staff function
- to whom the CIS officer reported in the training activity
- the number of branches in the CISO
- whether the CIS officer was also a training director or a training department head
- whether the CIS officer was civilian or military
- the rank of the CIS officer.

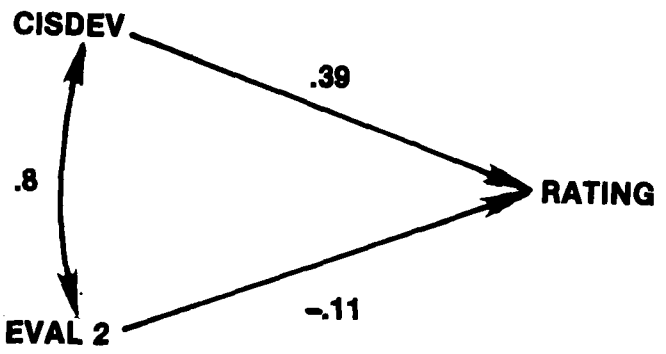

Figure 1. Path Analysis of the Effects of Curriculum and Instructional Support and Evaluation Functions on Ratings

Over 80 percent of the CISOs are staff units within local training activities; the remainder are line units. The typical CIS officer reports to the executive officer, while some report to positions one or two levels below the executive officer. CISOs usually have two branches, although several have only one and a few offices have three or four. Approximately 35 percent of the CIS officers are also either directors of training or training department heads. About 20 percent of the CIS officers are civilian and the typical rank for a military CIS officer is O-4, although they range from O-2 to O-6.

SECTION V

RESULTS AND DISCUSSION OF CISO EVALUATION: INTERVIEWS WITH LOCAL TRAINING ACTIVITY PERSONNEL

This section presents and discusses information obtained from interviews with CISO personnel and other local training activity personnel.

FACTORS AFFECTING CISO PERFORMANCE

Information presented in the previous section demonstrated that local CISOs are quite variable organizationally and in terms of tasks performed. Interviews with local CISO staffs and other command personnel centered on factors which influence local assignment of training quality functions to CISOs and/or otherwise operate to limit the success (in terms of enhancing the quality of training) achievable by CISOs. A number of such factors were discussed. They are complex, multifaceted and strongly interrelated. They do not operate in standard or uniform ways across all CISOs. Nevertheless, they represent both current and future problem areas which require attention. Modification or alternatives to the current CISO situation should consider ways of minimizing the impact of these problems in the interest of promoting training quality. The remainder of this section discusses factors which affect local CISO operations and potential effectiveness.

GENERAL DISCUSSION. By and large, local commands have adapted to the requirements established for CISOs by the various CNET and CNTECHTRA instructions. The commands have established these offices, and training development, instructional support, and training evaluation functions are performed locally. To say that the CISO concept, in its broadest sense, is not working would be technically incorrect. For the most part, functions required by higher authority instructions are performed by someone to some level at the local command. The functions are not necessarily performed by CISO staff, however, nor, in the usual case, are they performed by individuals who are administratively separate from the instructional departments. The issues that emerge are not so much compliance with the instructions but the manner in which compliance has been made and whether or not the actions taken are optimum and indeed conducive to good quality training.

No immediately available objective criteria or standards can be employed to assess the adequacy or effectiveness of CISO performance in terms of direct contributions to achieving quality training. Consequently, the "ideal" CISO configuration could not be objectively determined by the study. At several activities visited, however, local command staff expressed convictions that their own CISO organization was, in fact, ideal. And, local commanding officer/executive officer respondents to the short questionnaire did report that they were both generally satisfied with the performance of their CISOs, and that the offices were generally effective. In the absence of more objective criteria, however, these opinions could well be interpreted to mean that the local CISO has been organized and performs in ways that are satisfactory to the local command. Stated another way, the local command has found a workable solution to the problem of accomplishing a wide variety of functions within the confines of available resources.

RESOURCE AND PERSONNEL UTILIZATION PROBLEMS. Virtually all of the CISOs contacted during the study noted that they lacked sufficient manpower to perform the functions expected of CISOs. The implication is that many functions nominally designated for accomplishment by the CISO are not done there because of the absolute lack of manpower. Occasionally, they are not done because the assigned staff lack the necessary skills to perform the functions. Thus, the indicated solution is to staff "properly" CISOs and the functions will thereafter be performed. However, this is a deceptively simple solution in the CISO case and one that requires further discussion. The manpower resource problem must consider not only numbers of individuals but also the types of talent required for effective performance of CISO functions. An additional problem involves properly using talent. Specific personnel resource problems and related factors which apparently affect decisions concerning personnel use are discussed below.

Lack of Skills. The specific skills required to perform some of the tasks assigned to CISOs are frequently not available at local commands. Effective performance of the three major categories of functions assigned CISOs (i.e., training development, training evaluation, and instructional support) require specialized skills--subject matter expertise is not sufficient.

Effective training development requires personnel with knowledge of educational technology. They must also be able to apply this technology to designing and developing courses/modules of instruction. Training evaluation requires a different set of skills and knowledges. In this area, personnel are required who understand evaluation goals and can apply appropriate evaluation procedures. Accomplishing instructional support functions requires not only personnel capabilities in the above areas but certain communication skills are also desirable for providing training or conducting workshops and generally assisting others to accomplish training quality functions.

Many of the skills necessary for effectively accomplishing CISO functions are not routinely possessed by assigned enlisted personnel. They are also, at a number of training activities, probably not possessed in the depth required by the assigned education or training specialists. Given the lack of the specialized skills required for effectively performing CISO functions, some assigned tasks are not done at all and some are simply not done well.

Personnel Utilization Factors. Currently, there is a general lack of manpower at local training activities to perform all of the functions (not just CISO functions) required to produce graduates. Resources assigned to the local school are under the direct control of the commanding officer to use as his best judgment dictates to fulfill the assigned training mission. Given the current shortages of personnel to perform all functions at training activities, the local commanding officer is often faced with the prospect of either "robbing" the instructional departments to staff CISOs or "robbing" CISOs to perform other tasks. In many instances, local commanders, perhaps for lack of other alternatives and perhaps for other reasons, use personnel designated as CISO staff to perform tasks which are not in keeping with the instructions governing CISO responsibilities. For example, most CIS officers are assigned one or more additional duties as, for example, Legal Services Officer, Recreation Officer, Watch Bill Coordinator, Training or Training

Support Department Heads, United Fund Coordinators, Educational Services Officer, Personnel or Student Control Officer. It is difficult in many cases to decide which is the collateral duty, CIS officer or the other assignments. In addition, many senior enlisted personnel function as instructors and also perform CISO duties. Similarly, assigned education specialists are frequently used to perform general administrative and sometimes almost clerical duties (e.g., accounting, administrative record keeping, manpower, student scheduling, budgeting).

Factors that appear to operate (singly or in combination) to influence decisions for personnel utilization include:

- production pressures leading to preoccupation with the production process
- lack of understanding of the need for and nature and purpose of functions designed to promote quality in training
- implicit beliefs that only instructors can achieve high quality training coupled with unfavorable appraisals of CISO staff capabilities.

The pressure to produce graduates is one factor that probably affects the degree of attention given to training quality functions and, consequently, personnel assignments. This pressure, undoubtedly, contributes to a reluctance to expend time and resources on performing functions that are not considered as important as "getting graduates out." Some balance between meeting production requirements and ensuring training quality is obviously a desirable goal.

Discussions with local CISO staffs led to the conclusion that in many instances there may be less than adequate understanding on the part of local command personnel (including some CISO personnel) of the nature and purpose of functions and operations required to assure local training quality. In this area, short courses covering CNET purposes, goals, and procedures for areas such as Instructional Systems Development and evaluation techniques would be beneficial for local command personnel (especially all officers).

A number of local CISO staff (mostly education specialists) also noted during visits that some local commanding officers do not emphasize to their commands that the functions required by the CISO instruction should be accomplished by the CISO. CISO-type functions that are performed by the training departments may or may not be subject to CISO review or concurrence. In many instances, CISO staff have very limited, almost negligible, cognizance over the work or end products of the training departments. With respect to performing curriculum development functions, this may reflect an attitude that only subject matter expert (SME) instructors are qualified to develop instruction. It may also reflect a lack of understanding of what is required for systematic training development (e.g., ISD) or what an individual trained in educational technology can contribute to curriculum development.

An additional consideration is the current shortage of SMEs for instructional duties. Local school commanders are probably reluctant to assign staff to CISOs (or IPDCs) exclusively for duty as curriculum developers. Performing curriculum development functions in the training department where SMEs can also double as instructors would be desirable at some activites. However, this practice should not arbitrarily exclude CISO personnel from that activity.

A more subtle problem that affects local CISO ability to function effectively relates to the interface between CISO and training department staffs. A number of CISO personnel reported that training departments tend to ignore their existence. Consequently, they do not "invite" the CISO to participate in performing functions nominally assigned to CISO by higher command instructions. The training departments consider that these functions should be done by the training departments. Such functions include, most notably, curriculum development and test construction. At a number of activities visited, CISOs are excluded from meaningful participation in the curriculum development process. Even course outlines developed locally may not be reviewed by CISOs but go directly from the training department to CNTECHTRA for approval. Many CISOs state that they assist the training departments on an "as requested" basis, but their services may not often be requested. This may reflect an attitude that CISOs can not help because they are not usually subject matter experts. In smaller schools, training departments tend to make better use of CISO staff, perhaps because of the more apparent need to use all of the help available.

An additional problem may be the perceived role by military personnel of the civilian education specialists in the schools. Most CISOs are staffed with education specialists who most often sit in a higher level of command than do the departmental instructors. Thus, the reluctance to use CISO services may really reflect a reluctance to work with civilian education specialists who are in a position to review/criticize their efforts. And, instructors who will subsequently conduct the training may simply feel that they should have exclusive cognizance in its development.

INSTRUCTION LANGUAGE. One final factor that probably affects what local CISOs do is the language of the CNET and CNTECHTRA CISO instructions. The functions identified for CISO performance are preceded by a variety of action verbs (e.g., administer, coordinate, standardize, monitor) whose meanings are not always clear in the context provided (see appendix A). Thus, in many cases, local commands may not have a clear understanding of how higher authority expects CISOs to function.

CONCLUSIONS AND COMMENTS

Information obtained from the survey of CISOs leads to the general conclusion that the CISO concept has not been well implemented within the NAVEDTRACOM. A major reason for this inadequate implementation may be the general lack of manpower at local commands for performing all of the functions required to fulfill the assigned training mission. The lack of manpower results in dual personnel assignments to both training and CISO jobs. Thus, the required administrative separation of instructional departments and the

CISO has not been achieved. In addition, functions designated for CISO accomplishment often may not be performed at all, or may be performed inadequately. For CISOs, there are the additional problems of lack of specialized skills required for effective performance of expected functions, improper utilization of personnel, and proprietary issues involving roles and interrelationships of local personnel.

The problems of CISOs are complexly intertwined and no simple solutions to them are apparent. It seems clear, however, that simply adding resources to the local commands to perform CISO functions will not solve all the problems, given the local commanding officer's prerogatives and perceptions concerning how best to utilize his resources to accomplish his assigned training mission. At the very least, some tightening of controls over and/or greater attention to local training is needed to ensure the quality of that training. At present, there seems to be no effective system whereby local commanding officers are held directly accountable for the quality of the training given by their activity. Some system of accountability should be established to ensure that certain specialized personnel resources (e.g., education specialists) are used to perform tasks consonant with their training and experience. Similarly, some system is needed for ensuring that required quality assurance functions are, in fact, being performed locally and for checking overall training quality.

The basic concept of an office within a local training activity charged with responsibility for assuring training quality is sound. However, changes to the current implementation of this concept are clearly desirable.

SECTION VI

ALTERNATIVES FOR TRAINING QUALITY ASSURANCE

Information obtained during the study led to the conclusion that, in general, the local CISO concept as a means of assuring training quality has not been well-implemented. Consequently, as required by the basic CNET tasking, a number of alternatives to this concept were developed and assessed. These alternatives (options) were aimed at alleviating or overcoming problems that affect CISO ability to perform effectively. In developing options, Army and Air Force training quality assurance (QA) practices were appropriately considered. (These practices are summarized in appendix C.)

Initially, two "sets" of options were developed: nondisruptive and disruptive. The nondisruptive options feature minimal to moderate change to existing command organizations and the current distribution of training QA functions. These options are based on consideration for current characteristics of the NAVEDTRACOM; they propose no major organizational (or functional) changes. The disruptive options would require substantial changes to the current NAVEDTRACOM organization and to the distribution of quality assurance functions. These options address more the aspects of a command training management system than simply how to accomplish QA functions at the school level. Each set of options is more fully discussed below.

NONDISRUPTIVE OPTIONS

Table 12 lists a number of nondisruptive options that could be implemented to accomplish training quality assurance functions.

- Option 1, Maintain the status quo for all CISOs. This is the easiest option to implement. However, this option is undesirable, since it would ignore the problems associated with the CISO concept.

- Option 2, No organizational change; provide additional manpower. This option is also undesirable since many problems identified previously would remain. However, additional manpower would be provided to accomplish assigned duties and tasks. Yet, this option presents the additional problem of deciding what manpower would be required. Some CISOs could be adequately staffed by the addition of one billet while others could require 20 to 30 additional billets. If this option were selected, a study would be required to determine the appropriate manpower for each CISO.

- Option 3, No organizational change; institute an accountability system with more centralized control. Central management to assign priority of task to be completed. Local training personnel in the current system may have good knowledge of needed curriculum changes from feedback received informally from the fleet. However, these local personnel often do not understand who actually has control over a course curriculum or who has the authority to approve changes. The lack of clear lines of authority causes delay in

TABLE 12. NONDISRUPTIVE OPTIONS

1. Maintain the status quc for all CISOs.

2. No organizational chanqe; provide additional manpower.

3. No organizational change; institute an "accountability" system with more centralized control. Central management to assign priority of task to be completed.

4. Abolish CISO; put personnel in schoolhouse.

5. Split functions and assignments

	Course Development	Evaluation
a.	Contract	CNTECHTRA
b.	IPDC	CNET
c.	School	School
d.	CISO	CISO
e.	Combination of a/b/c/d	Combination of a/b/c/d

6. Organize CISOs based upon needs of different commands. Build a flexible organizational system.

approval of curriculum. It also contributes to lack of uniformity across training activities. Centralizing control would reduce confusion over authority and increase uniformity. However, such centralized control often fails to take into account special local problems and is typically less flexible.

- Option 4, Abolish CISO; put personnel in schoolhouse. This option abolishes the CISO but it does not abolish the need to perform various functions. If this option were adopted, there might very well be a reduction in attention to quality assurance on the part of local training activities.

- Option 5, Split functions and assignments. This option comprises several alternatives for course development and evaluation. It provides maximum flexibility for accomplishing any task since it could be assigned to the school, a contractor, IPDC, CISO, CNTECHTRA, CNET or any combination thereof. The problems are funding, coordination among many different activities, and accountability. However, some combinations under this option are desirable and may be necessary in the near future. The most likely combination that will emerge is having contractors assist in course development. Over 500 instructor billets recently have been contracted out,[3] setting a precedent in using civilian instructors in Navy schools. If this trend continues, it may be necessary to arrange for a portion of civilian instructors' time to be devoted to curriculum design/redesign.

- Option 6, Organize CISOs based upon needs of different commands. Build a flexible organizational system. This option reflects the current status of CISOs. This study found that the CISOs surveyed varied considerably in their operation. This may appear reasonable since each CISO operates within a unique context and flexibility is useful to accomplish local responsibilities. However, unlimited flexibility is undesirable. Some local commands do not currently use their personnel appropriately (e.g., some education specialists perform administrative duties). Section VII of this report presents the functions that should be performed at all training activities to assure the quality of training.

DISRUPTIVE OPTIONS

Disruptive options considered as alternatives to the CISO concept are shown in table 13. Each option presented is discussed below.

[3]CNET msg (NOTAL) 310013Z May 1978.

TABLE 13. DISRUPTIVE OPTIONS

1. Model CISOs based upon Air Force concept
   - Responsibility for courses designated to school
   - Single point manager for a course
   - Complete control of course by TPC.
2. Assign CISO personnel to IPD Centers.
3. Assign IPD Center personnel to CISO/schools on loan basis.
4. Visiting team concept for evaluation and/or curriculum development.

   Drawn from:
   - IPDC
   - CNTECHTRA
   - SMEs.
5. Use contractors for all course development/evaluation.

   Controlled from:
   - Central location
   - CISOs (redistributed).

- Option 1, Model the CISO based upon the Air Force concept. Single point management for courses is a central feature of Air Force training. This concept locates technical and administrative control of courses at the school level. TPCs could be assigned to schools to perform the same role as the course manager in an Air Force School (see appendix C). Placing the TPC in the school would in some cases provide an educational technologist to the school as well as locate managerial control of the course at the local level. One problem of implementing this concept is that additional TPCs would be required since there are over 4,000 courses in the Navy.

- Option 2, Assign CISO personnel to IPDCs. This option is feasible for schools in San Diego, Great Lakes, Memphis, and Pensacola, where there are IPDCs. Potential problems with this concept, however, are: (a) remote location of personnel from courses that need revision, (b) reduction of personnel at schoolhouses, (c) "not developed here" syndrome.

- Option 3, Assign IPDC personnel to CISO/schools on loan basis. This option would provide additional, specialized manpower to schools for short durations. However, under their current workloads the IPDCs do not have adequate personnel to perform their presently assigned tasks.

- Option 4, Visiting team for evaluation and/or curriculum development. A team of NAVEDTRACOM personnel with specific talents and expertise could be assembled and sent to local training activities to train local personnel and to provide direct assistance. CNTECHTRA (Code N63) currently provides some support of this type to CISOs. Negative aspects of this concept include the need for extensive travel funds, the reluctance of many people to travel for extended periods of time, and the loss of these personnel at their home duty station for long periods of time. However, this option does offer a promising short range solution to the manpower shortage at the CISOs.

- Option 5, Use contractors for all course development/evaluation. Another promising option to alleviate the shortage of manpower is to use contractors for some quality assurance functions. The positive aspects of using contractors include expertise and sufficient manpower. The negative aspects include cost, monitoring problems, and lack of responsiveness to the school. Currently, the NAVEDTRACOM is establishing an organization to provide contracting assistance to its functional commands. This organization, the Commercial and Industrial Type Activity (CITA), could be requested to analyze CISO functions to assess the cost effectiveness of contracting some of them out.

Having considered various options for training quality assurance, however, the TAEG concluded that the CISO concept should be retained. Consequently, a proposed charter for the future operation of CISOs was written. This charter incorporates aspects of several of the options discussed above;

however, it assigns primary responsibility for the quality of training to the local command. The proposed charter is presented in the next section of this report.

SECTION VII

A PROPOSED CHARTER FOR CISOs

This section presents a brief rationale for retention of the CISO concept and a proposed charter for the future operation(s) and organization of these offices.

RATIONALE FOR APPROACH CHOSEN

Intensive discussions held within TAEG, with CISO staffs throughout the NAVEDTRACOM, and with other services' staffs led to the conclusion that operations to enhance training quality must occur at the local schoolhouse level and that responsibility for performing necessary QA functions should be vested at that level.

The basic notion underlying the CNET and CNTECHTRA instructions that established CISOs within the NAVEDTRACOM is that certain functions should be performed at the local schoolhouse level to assure Navy training quality. In this sense, the instructions are attention-directing. They list functions that should be performed and provide a mechanism in the CISO concept for their accomplishment. Even though resource and other constraints may operate to limit the degree to which CISOs can accomplish QA functions, the existence of the concept provides at least a minimum guarantee that certain features of local training will receive more attention than they would have if the concept had not been established. In addition, the instructions recognize that systematically applying modern educational technology in designing and developing instruction, continuously evaluating the instructional system, and correcting deficiencies are necessary for establishng and maintaining a high level of training quality. Thus, there are a number of positive features and benefits for training associated with the notion of a local quality assurance office or CISO. However, certain adjustments to the current implementation of the CISO concept are indicated to promote the cause of training quality.

RECOMMENDED CHARTER

The remainder of this section presents recommendations for the future accomplishment of training quality assurance functions.[4] The recommendations are given in the form of a "charter" for a quality assurance office (or CISO) to operate within the local school. The functions considered necessary for assuring training quality are presented first. Where necessary, the purpose and meaning of functions are defined. A recommended level of involvement for a local QA office is also given. Level of involvement

[4]The term "quality assurance" should be interpreted in a broad sense to include consideration for all efforts required to establish, implement, and maintain a high level of quality in training. It includes concern for the design and development of curricula and training aids and materials, instructional support, and training evaluation.

considerations are based principally on the recognition that the greatest potential contribution to training quality from individuals normally connected with CISOs is in the area of educational technology and not in subject matter expertise. Considerations for organization and staffing of CISOs are presented after the suggested functions.

The TAEG endorses the notion that the CISO should continue to be an integral part of the activity which it serves and not an agent of higher authority. However, based on findings of the study, it appears desirable to strengthen the interface between local CISOs and CNTECHTRA (especially CNTECHTRA Code N63) for specific purposes designed to assist in achieving quality training. Consequently, specific recommendations in this area are also presented. It also became clear during the study that certain minimum enforcement mechanisms would be desirable in the future to ensure that necessary training quality assurance functions are accomplished at the schools, and that the talents of individuals, both SMEs and education and training specialists, are appropriately used to meet the common goal of high quality training.

The discussions presented below focus on each element comprising the proposed CISO charter, specifically:

- quality assurance functions
- CISO organization and staffing
- higher command interfaces
- accountability mechanisms.

QUALITY ASSURANCE FUNCTIONS. As mentioned previously, an overall list of functions currently considered appropriate for CISOs to perform was compiled from applicable instructions and from inputs received from the CISO survey (visits and questionnaires) and from CNTECHTRA staff. This overall list is presented in appendix A. It served as a principal basis for developing functions to be performed to promote local training quality in the future. All functions listed were carefully examined and deletions were made from the list. The functions eliminated were those which, in the judgment of TAEG, are unnecessary or inappropriate for a local training quality assurance operation. This judgment was aided by inputs received from CISOs, CNTECHTRA staff, and Army and Air Force personnel. The resulting list of functions are those which are considered appropriate for assignment to a CISO or CISO-like organization functioning at the local schoolhouse level.

It is believed that the functions retained best reflect the spirit of the basic CNET and CNTECHTRA instructions; i.e., training quality assurance. Effective accomplishment of these functions requires applying educational technology and evaluation skills. Only a limited number of administrative functions have been retained for consideration of performance by a CISO or CISO-like organization. These are functions that are either logical outgrowths of technical functions identified for CISO performance or that cut across departmental lines and thus make a CISO-like organization a logical

candidate for their accomplishment. Functions that serve only one department or that make the CISO little more than an administrative unit for a training department were eliminated from consideration. Similarly, those functions that appeared to involve only material storage or that were essentially clerical were eliminated. In short, the functions advanced for accomplishment by CISOs are those based on, and requiring, proper employment of technical talent in the interest of training quality assurance. The functions eliminated from the basic list (appendix A) should probably continue to be performed at local levels; however, they are considered inappropriate for an organization that should be directly concerned with and responsible for training quality.

The functions remaining after the elimination process described above were grouped into five major categories. The five major categories listed in order of importance for assuring training quality are:

- Curriculum Design/Redesign
- Evaluation
- Instructional Support
- Administrative
- Special Training Support.

Each category requires, for the most part, different sets of technical skills. The first three sets of functions represent a minimum list of efforts that should be accomplished at, or for, all schools to assure the quality of a school's training. These functions should be performed by individuals who possess appropriate educational technology and evaluation skills. Suggestions for augmenting local staffs are provided on page 72 under "Organization and Staffing Considerations."

In developing the recommendations presented in this section, the realities of the local school context have been considered and a concerted attempt has been made to achieve a balance between resources needed and resources currently (or likely to be) available. Although the functions identified should be performed at all activities, a considerable degree of flexibility has been retained to permit local commanding officers to decide how best to accomplish the functions within his/her own activity.

Figure 2 displays schematically the functional areas of responsibility recommended for CISOs. Beneath each of the five major categories of functions, more specific functions, and recommended involvement are displayed.

Each group of recommended QA functions and subfunctions is discussed separately below. Note that the language in which the functions were originally expressed (see appendix A) has not always been retained. Where necessary for clarification of intent, functions are defined. In addition to listing the functions, a recommended nature and level of involvement in accomplishing functions by a local CISO is given. Recommendations for level and nature

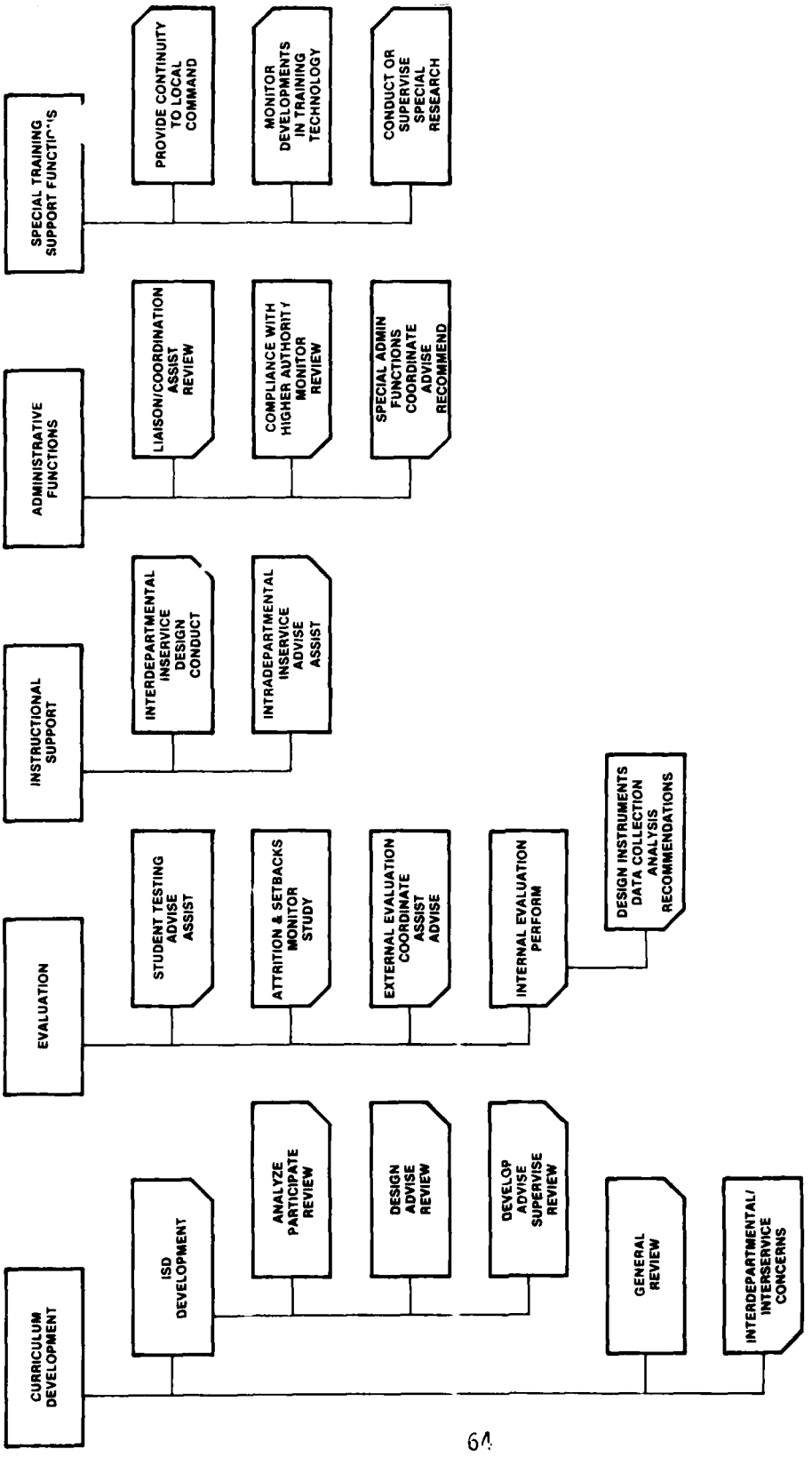

Figure 2. Recommended CISO Functions and Involvement

of involvement reflect the opinions of various NAVEDTRACOM and TAEG personnel and practices of other military services.

Curriculum Design/Redesign Functions. Suggestions concerning how local CISOs should be involved in curriculum design/redesign functions are given in table 14. The functions that must be performed are specified in NAVEDTRA 110A. The numbers in the cells of the table (keyed to the action verbs at the bottom of the table) denote the recommended nature of CISO involvement in each function. Recommendations for CISO involvement in functions are shown for four different conditions under which curriculum development work may occur:

- local development in which the local school is directly responsible for the effort
- IPDC responsibility for the development work
- contract development where the local school is cognizant of the effort
- contract development where some other activity (e.g., IPDC, CNTECHTRA) is cognizant of the effort.

Recommendations concerning CISO involvement in curriculum design/redesign functions represent the collective opinions of various NAVEDTRACOM personnel. Individuals providing the rankings were CNET and CNTECHTRA staff personnel highly knowledgeable in ISD principles and procedures, TPCs, local CISO staff, and local training activity commanding officers. Thus, a cross-section of command opinion is reflected in the composite recommendations given in table 14. Using the action verbs listed at the bottom of table 14, 15 individuals independently recorded their first, second, third, etc., choices concerning how CISOs should be involved in the functions. The assumptions under which the rankings were made are:

- ISD procedures must be followed in curriculum design/redesign
- the local CISO representative is an education specialist trained in ISD procedures
- the local CISO representative is not a fully qualified subject matter expert.

The TAEG recommends that the entries in the table be considered as minimum ways in which CISO staff be involved in the future in curriculum design/redesign functions.

Additional specific recommendations for CISO involvement in this area are that the CISO:

- advise/assist curriculum developers with the integration of special areas such as PQS, 3M, safety

- coordinate interservice training requirements relative to curricula.

Further, the CISO should continue to review and approve all locally produced training publications. This office should also be involved in periodic reviews of all courses (i.e., course materials, training aids and devices, objectives) and curriculum control documents to ensure their currency and accuracy.

Evaluation Functions. Evaluation functions with which CISO personnel might be effectively involved are presented below in four broad groups: student testing, attrition and setbacks, external evaluation, and internal evaluation. The discussion of these functions includes definitions, rationale for their desirability, and appropriate levels of involvement for CISO personnel.

Student Testing. The principal role of CISO personnel in student testing programs should be one of providing professional advice to instructional personnel concerning constructing and revising tests. This would include consultation concerning format, administration, and interpretation of test results. Also, the evaluation of the psychometric properties of tests (e.g., reliability, validity, and discrimination) is highly desirable. Test evaluation implies collecting test results and maintaining test item data banks. However, this record keeping is essentially a clerical or administrative function, and it is not essential that the individual or group collecting the data actually reside in the CISO. Such assignment of clerical or administrative functions is probably best left to the commanding officer, with the understanding that the responsible CISO personnel should determine the appropriate format and content of the test item data bank.

Attrition and Setbacks. CISO personnel can usefully serve as professional advisors concerning academic attrition and setback problems. As advisors, CISO personnel would design studies to determine causes and correlates of attrition and setbacks. On the basis of those studies, they would further recommend plans for dealing with the problems. Such actions should be contingent on the rate (or trends in rate) of attrition and setback. For example, rates of attrition or setback approaching or exceeding those prescribed by higher authority would serve as an indicator that studies concerning the problems should be implemented. Further, if trends indicate rising rates of attrition or setback, action might be taken before a specified rate is reached. It should be noted that a zero attrition or setback rate is not only unlikely but may be undesirable, since it might indicate that standards are too low. The preferred methods for dealing with attrition or setbacks do not typically include lowering of standards.

External Evaluation. The actual conduct of external evaluation is typically the province of activities external to the local school. However, CISO personnel can make valuable professional contributions in this area by serving as the technical liaison between the schoolhouse and the evaluation activities of higher authority. The major involvements of CISO personnel with external

TABLE 14. RECOMMENDED CISO INVOLVEMENT IN CURRICULUM DESIGN OR REDESIGN

CURRICULUM DESIGN/REDESIGN FUNCTIONS	LOCAL DEVELOPMENT	IPD CENTER DEVELOPMENT	CONTRACT DEVELOPMENT	
			LOCAL SCHOOL COG	OTHER COG
1. Analyze Job/New Requirements	4,7A	3,9	3,9	9,3
2. Select Tasks to be Trained	4,3	9,2A	3,9	9,3
3. Select Job Performance Measures	9,3	3,9	9,3	9
4. Analyze Existing Course/Modules	9,4	9,2A	9,3	9,6
5. Select Instructional Setting	9,4	2A,9	9,3	9,2B
6. Develop Objectives	3,9	9,3	9,7A	9,2B,7A
7. Develop Test Items to Measure Objectives	9,3	3,9	9,7A	9,2B,7A
8. Describe Entry Level Behavior	3,5	3,2A	3,9	9,2A
9. Establish Objectives/Course Sequence	3,5	2A,3	9,3	2A,2B
10. Specify Learning Events/Activities	3,5	9,3	9,3	9,2B,7B
11. Specify Instruction Management Plan and Media	3,5	2A,4	9,4	9,4,7
12. Review/Select Existing Materials	5,3	6,3	9,6	9,2B
13. Develop Instruction	3,9	9,6	9,3	9,2B
14. Validate Instruction	9,4	3,2A	9,4	9,3

1. Do alone
2A. Monitor - General cognizance only 2B. Attend meetings
3. Advise
4. Participate
5. Supervise
6. Coordinate
7A. Approve format 7B. Approve content
8. Instruct
9. Review
10. Develop plan

evaluation should be to advise and assist instructional personnel with the preparation of NAVEDTRACOM TAS Level II questionnaire items, to interpret findings from external evaluation as they are received from higher authority, and to advise and assist schoolhouse personnel concerning appropriate responses to any weakness(es) indicated by the evaluation. This level of involvement will allow the local command to make maximum use both of the professional capabilities of CISO personnel and of the feedback obtained from a formal external evaluation. Such external evaluation, standardized as it is across numerous local training commands, may require some local interpretation before it is directly applicable at the local level. Further, the mere indication of a problem, necessary though it is, is not adequate for the solution of the problem. Therefore, CISO personnel, in conjunction with others at the local command, will need to transform that feedback into a plan of corrective action.

Internal Evaluation. Evaluating the process or outcome of instruction within the schoolhouse constitutes internal evaluation. Internal evaluation involves numerous steps or actions and comprises the major portion of evaluation activities recommended for CISO personnel. The CISO should serve as an arm of the commanding or executive officer for internal quality control and quality assurance. With the exception of specialized technical knowledge relevant to particular ratings in the Navy, the CISO should have the necessary expertise and authority to plan and conduct all aspects of internal evaluation, from the design of evaluation programs to the diagnosis and prescriptive remedies delivered to the executive or commanding officer concerning all aspects of the training mission of the local command. Internal evaluation should be a continuous process.

Designing and executing an overall, comprehensive internal evaluation program is complex and many decisions must be left to the professional discretion of local CISO personnel. Although there will be certain problems common to all training activities and certain evaluation techniques of value to all training activities, there will be enough variation among schoolhouses to preclude attempts to prescribe standard internal evaluation programs that will meet the needs of each school. Professional personnel in the CISO, in consultation with instructional personnel, should design internal evaluation programs and procedures that are responsive to local problems and needs. Results from formal external evaluations, when available, should be appropriately used by local training activities to determine desirable changes in internal evaluation programs.

Personnel returning from fleet duty to the schoolhouse constitute a source of training feedback information that can also be used for internal evaluation purposes. A detailed structured interview procedure is available for obtaining information from this source (Hall and Hughes, 1980). The CISO should have the necessary professional and technical skills to conduct all internal evaluation efforts for the local command and to compare, combine, and integrate information from the various sources.

The majority of internal evaluation functions should be handled by CISO personnel, the exception being those functions that require specific technical expertise in various Navy ratings. In those cases, CISO personnel

should work with local subject matter experts and/or with TPCs and Technical Audit teams as necessary. CISO personnel should have cognizance over internal feedback functions that require applying professional educational and psychometric skills. These functions might include, for example, the following:

- designing internal feedback instruments, such as student critique forms and instructor evaluation forms
- supervising data collection, analysis, and interpretation
- preparing diagnostic reports based on internal feedback data, with recommendations for corrective action
- monitoring trends in the results of various internal evaluation efforts so that potential problems may be dealt with before they become critical.

It should be noted that the above functions are broad in scope and will require accomplishing a great many specific enabling functions. However, in order that sufficient flexibility remain for meeting unique local needs, the details of accomplishing broad internal evaluation functions should best be left to the discretion of professional CISO personnel.

Figure 3 depicts possible relationships among internal evaluation, external evaluation, instructional change, and graduate performance. The cycle between internal evaluation and instructional change should be more or less continuous. Shortcomings in the instructional process uncovered by an ongoing internal evaluation program would give rise to corrective changes in the instructional process. In turn, changes in the instructional process should give rise to changes in the internal evaluation process, in order that the internal evaluation program can remain tailor-made for that local training activity.

While the cycle of changes between internal evaluation and the instructional process should repeat frequently, a more infrequently occurring cycle will include external evaluation and changes in graduate performance. A formal external evaluation can provide valuable information to local training activities concerning strengths and weaknesses in training. However, there are limitations to the usefulness of external evaluation results as they are likely to be delivered to training activities. First, the NAVEDTRACOM external evaluation system is designed to serve all training activities. It is not designed to serve the unique needs of specific training activities (although CNET 015 may conduct specific evaluations requested by a local command). Therefore, some translation by local professional personnel of the external evaluation results is both desirable and necessary. Second, although external evaluation may uncover weaknesses, it will not typically disclose solutions. Thus, the external evaluation results should serve to give guidance in the revision of internal evaluation, which will be designed to fit the unique problems of the local activity and to explore possible solutions to existing problems as well.

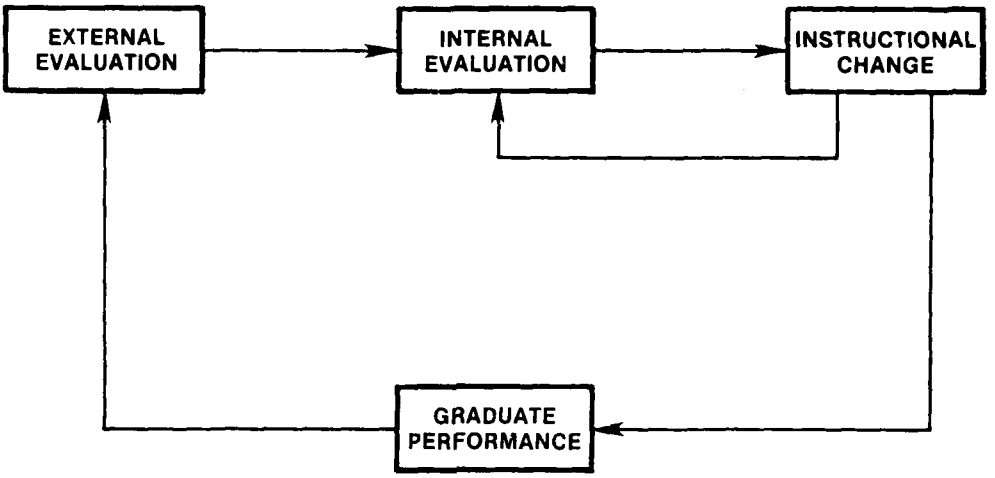

Figure 3. Relationships Among Components of a Quality Assurance Program

The link between external evaluation and the instructional process is graduate performance. Changes in the instructional process should result in changes in graduate performance; changes in performance should result in changes in external evaluation results. Finally, results of external evaluation should lead to internal evaluation and, when necessary, to changes in instructional delivery.

Instructional Support Functions. Instructional support functions recommended for CISO accomplishment are concerned mainly with the conduct of inservice training for local personnel. The CISO should have primary responsibility for conducting inservice in various professional educational areas, including curriculum design, instructional delivery systems, test development, and evaluation techniques. Such inservice programs would cross departmental lines and would be relatively independent of technical subject matter. Also, CISO personnel could offer special workshops as needed in areas of special interest to instructional personnel. Inservice programs that are designed for a specific technical subject matter are probably best accomplished within a training department. However, CISO personnel would be expected to serve in a consulting role similar to that served for any other program of instruction. This consultation would include advice concerning curriculum format,

instructional delivery and evaluation of the effectiveness of the inservice program.

Administrative Functions. As noted previously, the only administrative type functions considered appropriate for a local QA office (CISO) are those that arise as a natural or logical consequence from the performance of other more technical functions, certain functions that cut across departmental lines, or that involve outside activities from a quality assurance standpoint. Suggestions concerning delegating administrative functions to local CISOs are discussed below.

Liaison/Coordination. The CISO could properly function as the local command's interface with external agencies on matters concerned with training quality assurance practices and programs at the local activity. The office could serve as an initial point of contact for outside activities requesting information or assistance in these areas. It is further suggested that this office serve as the primary point of contact concerning applying educational technology to local training. As part of this function, the local CISO could provide liaison with fleet activities and other training units for these matters.

Since the CISO activities and interests cross departmental lines, there are certain other coordinating functions that might logically be assigned to these offices. These include:

- coordinating and staging IG requests involving training quality assurance matters
- coordinating and sponsoring visits from NAVEDTRACOM, Navy, and other military service personnel concerned with training quality assurance
- reviewing and coordinating requests from research activities for access to research subjects, technical assistance, or student record data to conduct TECHTRACOM sanctioned studies.

Compliance with Higher Authority. As the central, local repository for training technology expertise, the CISO should review all local training instructions to determine their currency and compliance with higher authority instructions. Appropriate recommendations should be made to the local commanding officer.

As part of a continuing quality assurance of training function, the CISO should critically review all practices of the training departments and make appropriate recommendations to the departments for maintaining good quality assurance practices and procedures. At a minimum, the CISO should determine that training departments have established and are maintaining programs required by higher authority. For example, the CISO should ensure that training departments conduct annual course reviews, collect, record,

and maintain appropriate records on students. A central file of all instructions could be maintained by this office and CISO personnel should assist the training departments in understanding and complying with the instructions.

Special Administrative Functions. In addition to the functions discussed above, there are certain other special administrative functions that could be performed well by the local CISO. It is recommended that the CISO:

1. Coordinate accreditation requirements and review.

Because of the nature of personnel training and the interdepartmental role it serves, the CISO seems a logical choice for performing all necessary coordination/review for accreditation of local courses.

2. Recommend candidates for Master Training Specialist designation.

A logical outgrowth of functions performed to evaluate instructors is the recommendation of candidates for the Master Training Specialist designation. This practice is not currently followed; however, CNTECHTRA staff submit that it may be adopted by the command. Related to this function is the designation of "Instructor of the Quarter." Many CISOs now assist in this activity and it is recommended as a continuing CISO function.

3. Advise the commanding officer on CISO civilian affairs.

The senior civilian education or training specialist assigned to the CISO should routinely assist and advise the local commanding officer on matters affecting the professional civilian work staff. This should include hiring, promotions, demotions, transfers, discharges, and training, as they pertain to civilians attached to the CISO.

Special Training Support Functions. There are other functions that should be the province of the CISO but that do not fall neatly into any other previously mentioned category. These functions should, for the most part, be the concern of civilian education specialists within the local training command. The senior education specialist should provide continuity to the local command on all matters of curriculum, instructional programs, and evaluation programs. Education specialists should also monitor current developments in training methodology, technology, and research, with a view toward possible useful applications at the local command. Education specialists may, as situations and needs arise, conduct or supervise the conduct of special research projects or studies in training areas of interest. They, or other qualified CISO staff, could also attend and monitor pilot courses to provide constructive criticism and assistance in improving or finalizing the courses.

ORGANIZATION AND STAFFING CONSIDERATIONS. Suggestions and comments relevant to CISO organization and staffing are given below.

Organization. Since the routine accomplishment of many of the functions suggested involves various levels of a local command, it is recommended that the CISO report directly to the executive officer. The CISO may be

headed by an officer or by the senior education specialist. However, unless the officer has an adequate background in educational technology and/or evaluation, the senior education specialist, because of his specialized knowledge and skills, should have cognizance over the majority of CISO functions. If an officer does head the CISO, he/she should be at least equal in rank to the training department heads. A desirable requirement for naval officers assigned as CIS officers is to be designated, or working towards designation, as an education and training management subspecialist. Regardless of who heads the CISO, it should be recognized that the primary mission of the CISO should be applying educational technology and evaluation techniques to local training problems. The training activity CISO should be the central repository of educational technology and evaluation expertise. Accordingly, it is recommended that all education and training specialists be assigned to this office. When needed, they could provide assistance to individual training departments. CISO personnel should be allowed direct liaison with instructional personnel, since there should be a great deal of cooperative work. Since the two broad missions of the CISO are curriculum support and evaluation, and since these areas represent different skills and techniques, there should be two divisions to the CISO--curriculum support and evaluation.

Figure 4 depicts proposed CISO relationships. The relationships indicated by solid lines in figure 4 represent tasking authority. Thus, the CISO branches report to and are tasked by the CIS officer, who, in turn, reports to and is tasked by the commanding/executive officer. The relationships indicated by dotted lines represent direct liaison between the CISO and the local training departments and between the CISO and CNTECHTRA N63 and other interested activities. The proposed relationship with CNTECHTRA N63 is discussed further below. Although figure 4 focuses on CNTECHTRA, it is suggested that CISOs under other CNET Functional Commanders be organized in similar ways.

Staffing. The basic functions suggested for performance by local CISOs represent a minimum set which should be performed in the interest of establishing and maintaining high quality training programs. They should be performed at all training activities regardless of the size (i.e., numbers of courses, student throughput) of the activity. With the exception of certain administrative functions, it is recommended that they be performed by individuals trained in instructional design and in evaluation techniques. Ideally, the CISO staff should also contain individuals with instructional skills who can provide training for other local personnel.

In general, there are three factors to consider when staffing a CISO. First, there must be personnel knowledgeable in applying educational technology to training problems. These skills would most likely be present in an education or training specialist. However, it is the possession of knowledge and skills that is important, not the possession of degrees or titles. Second, there must be personnel knowledgeable in the techniques of evaluating training programs, such as someone with graduate training in social science methods. Again, however, the crucial issue is possession of skills and knowledge, not degrees. Third, the CISO must have access to SMEs for the

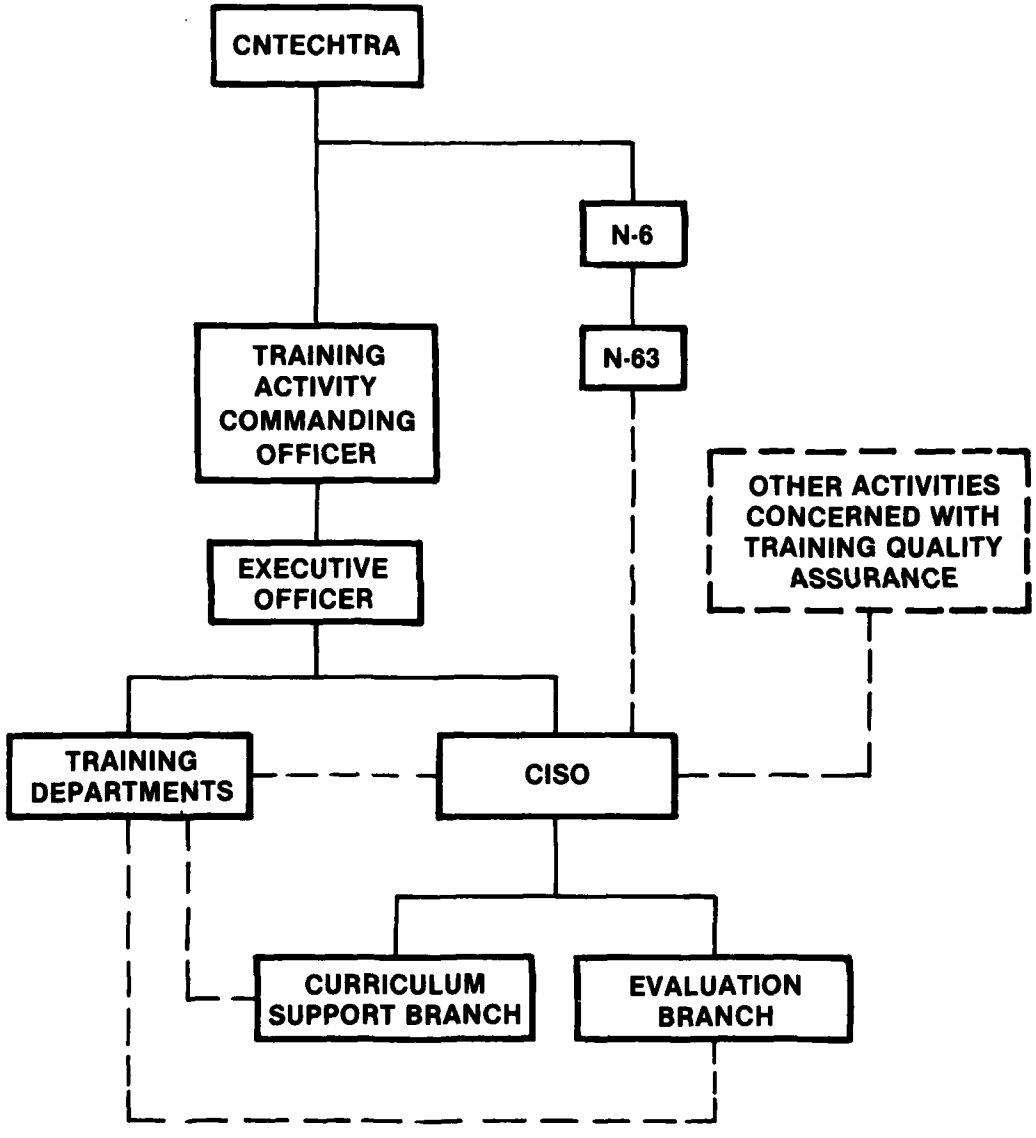

Figure 4. Proposed CISO Relationship within the Local Command and with other Activities

ratings represented by the courses taught at the local school. It is probably not necessary that these SMEs belong solely to CISO; they could be shared with instructional departments or, perhaps, rotated back and forth.

Normally, requisite capabilities for training quality assurance are associated with education specialists (1710 series) and training specialists (1712 series) and, occasionally, education technicians (1702 series). However, there is no reason why necessary skills cannot be obtained by assigned military personnel through appropriate combinations of experience and training. It is recommended that selected military staff be designated by their commands to receive such training and be assigned CISO duties independently of instructional duties. In this context, it is further recommended that consideration be given to the creation of an educational and training career field for enlisted personnel.

Undoubtedly, local commands would prefer that the capabilities required to perform all necessary QA functions be resident within the given command, and it is recommended that all training activities be assigned at least one 1710 or 1712 for CISO work. However, the number(s) of such individuals who are actually needed at local levels cannot be easily determined. Optimum staffing for any one command is a complex problem for which there is no simple solution. Staffing requirements are a function of QA workload. This workload is affected by the number of courses and, in the case of curriculum design/redesign functions, by the frequency and extent of change required for courses. Staffing requirements are also affected by the skills and capabilities of individuals already assigned to a command and by the way in which assigned talent is used.

Given the currently austere funding situation within the NAVEDTRACOM, additional billets/positions for necessary specialized talent may be extremely difficult for local commands to acquire (although they certainly should attempt to do so when this is warranted). Consequently, local commands, at least in the short run, should be encouraged to obtain necessary training through CNTECHTRA for assigned military and civilian staffs. Travel funds should be available for this purpose. A second alternative is to request direct assistance from CNTECHTRA for accomplishing necessary functions (see also pages 76 and 77).

It is recommended that, at the very minimum, local CISO staff (military or civilian) be given appropriate, necessary experience or training and that the local CISO perform the evaluation functions listed previously without direct outside assistance (other than training). It is also recommended that appropriate administrative functions listed previously be performed by the local CISO.

Requirements for outside assistance most often will arise for performance of curriculum design/redesign functions and certain instructional support functions as influenced by local CISO staff capabilities. Outside support may take forms ranging from simply providing training to assigned local staff through the accomplishment of significant portions of a design effort by an outside activity (e.g., perform all the necessary task analysis and provide results to the school).

It is not possible to discuss all of the possible contingencies, shared responsibilities, or nature of interactions that could occur for curriculum design/redesign efforts. It is suggested that specific arrangements to accomplish necessary work be made on a case by case basis. In this regard, it is further suggested that the local command prepare a course development plan that identifies:

- the course(s) requiring development work
- the nature and extent of work required
- local plans for performing the work to include:
  - .. identification of individuals who will be assigned to do the work
  - .. skills and qualifications of these individuals
  - .. amount of time each will devote to given segments
  - .. duration of planned effort and impact
  - .. specific needs for assistance in the effort(s).

These development plans could be forwarded to CNTECHTRA via the TPC or directly to N-63. Dialogues between appropriate CNTECHTRA and school personnel could then focus on clarifying specific assistance needs. Using the plan as a basis, CNTECHTRA N-63 could then arrange for obtaining required assistance (e.g., from the TPC, N-63 staff, IPDCs, contract). It is recommended that in most cases ultimate responsibility for the course development effort remain at the local level where the subject matter expertise resides. Thus, the outside activities, in most instances, will be serving a supporting role. In addition to the planning purpose of the suggested development plan, this document could also be used in conjunction with the "accountability system" discussed below.

COMMAND INTERFACES. The CISO should remain an integral part of the activity that it serves; it should not become an agent of higher authority. However, it is recommended that stronger ties be formally established between CNTECHTRA N-63 and local CISOs. CNTECHTRA N-63 has overall responsibility within the TECHTRACOM for many of the same functions that CISOs perform locally. Direct tasking authority from CNTECHTRA N-63 to the local CISO is not advocated; this would in fact make the CISO an agent of higher authority and would probably have undesirable, disruptive effects. A dotted line (ADDU) relationship between N-63 and the local CISO, similar to that of local schools to CNTECHTRA TPCs, is envisioned. CNTECHTRA N-63 should serve as an open, direct link between CISOs and the TECHTRACOM for guidance or assistance in training quality assurance matters. Specific recommendations are that N-63:

- assist CISOs in identifying and obtaining appropriate personnel or other resources needed for effectively accomplishng local quality assurance functions. This assistance should concern both permanent and temporary resource augmentation.

- provide or obtain inservice training for local CISO staff. This training could be conducted at various locations by N-63 staff or by other agencies arranged for by N-63. Appropriate funding will be required.

- advise CISOs of planned higher authority initiatives that may affect local training quality assurance practices and assist in preparing for new requirements.

- provide direct technical assistance to the CISOs for specialized problems. In addition to providing training for CISO staff, N-63 staff could assume direct responsibility for executing portions of the quality assurance work required at the local level.

- monitor actively, through the CISOs, all training quality assurance operations at local levels.

Implementing the above recommendations will require augmenting the N-63 staff and appropriate funding for performing the assistance functions described. CNET may wish to consider if CNTECHTRA N63 should provide similar assistance to CISOs reporting to other Functional Commands.

ENFORCEMENT/ACCOUNTABILITY. The CISO concept as a means of assuring the quality of local schoolhouse training is affected by a number of factors. These factors limit CISO operations and affect the degree of effectiveness for training quality assurance that these offices can achieve. It was stated in section V that some method(s) of assuring that local commands properly employ CISO personnel and otherwise strive to achieve a high level of training quality is desirable. In this regard, it is recommended that an accountability system be developed and implemented. This system could provide information concerning local quality assurance practices and problems to the activity commanding officer. This information should also be available to higher authority for review of local actions. To avoid undue infringement on the local commander's authority and prerogatives, it is suggested that, for the most part, internal mechanisms visible to higher authority be considered for accountability purposes. An accounting procedure for local commanding officer use is one possibility; for example, a checklist containing functions assigned to CISOs could be used to record requests or needs for educational technology assistance, reasons for not receiving it, CISO initialing to indicate participation in efforts. These checklists should then be available for inspection by higher authority during audits, reviews, etc., or when external feedback indicates that significant numbers of course graduates are considered inadequate. Consideration could also be given to a higher authority instruction requiring the schools to develop and submit plans concerning how educational technology expertise will be applied at the schools. Periodic audits for compliance or for providing directed assistance could be accomplished by CNTECHTRA N-63. In addition, N-63 could also be assigned responsibility for reviewing the audit trail for ISD programs conducted by local activities. It is recognized that an additional means of obtaining accountability is inherent in the CNET Training Appraisal System (TAS) results. Interpreting the results of those feedback findings in relation to operations at the local schools is complex, however.

SECTION VIII

RECOMMENDATIONS

Work performed during the study led to the conclusion that the CISO concept is basically sound. A number of positive features and benefits for training are associated with the notion of an office within a local training activity that is specifically charged with responsibility for assuring training quality. However, the CISO concept has not been well implemented within the Command. CISOs across the NAVEDTRACOM are highly variable organizationally and in terms of the functions they perform. Further, a number of local conditions limit the potential effectiveness of these offices. These include lack of manpower (both numbers and types of skills required) and other factors which affect local utilization of assigned CISO staff.

Two sets of recommendations are offered for improving CISO contributions to training quality. The first set concerns the total CISO concept. These recommendations, presented in section VII of this report, are provided in the form of a proposed charter. Specific elements of the proposed charter concern the following areas:

- functions that are appropriate for CISO staff to perform
- organization and staffing of CISOs
- interfaces between local CISOs and CNTECHTRA
- mechanisms for ensuring the performance of training quality assurance functions at local command levels.

The second set of recommendations consists of separate actions that could be taken to assist generally the cause of enhancing the quality of local training. These are listed below:

1. Develop a short course covering purposes, principles, and procedures of ISD and require that at least all officers reporting to training command billets complete the course.

2. Develop a handbook based on NAVEDTRA 110 for use of CISO personnel to provide guidance/instructions concerning tasks assigned to them. This handbook should contain information such as how to conduct task analyses, develop tests, requirements and procedures for instructor evaluation. In addition to providing guidance, the handbook should also identify sources where more detailed information on specific topics can be found.

3. Develop standardized courses in training quality assurance areas. These courses could be used for training of CISO personnel. They could also be used by CISOs for inservice training of other locally assigned personnel.

4. Rewrite instructions governing CISOs. Currently, several CNET and CNTECHTRA instructions assign tasks to CISOs. It is recommended that

these taskings be appropriately consolidated and that one instruction, with cross references as necessary, be written and promulgated for CISO guidance.

5. Establish a direct interface between CNTECHTRA and local CISOs for defined purposes. It is specifically recommended that CNTECHTRA N63 be appropriately tasked, staffed, and funded to:

- maintain direct cognizance over local CISO operations
- assist local CISOs in resolving problems and obtaining resources or training needed to perform assigned work.

6. Establish proficiency billets for military personnel to be assigned to CISOs.

REFERENCES

MILITARY

Air Force Manual 50-2, Instructional System Development, 25 May 1979. Department of the Air Force, Hqs. U.S. Air Force, Washington, DC 24330.

CNET Instruction 1540.3B, NAVEDTRACOM Training Appraisal/Feedback System, 2 June 1981. Chief of Naval Education and Training, NAS, Pensacola, FL 32508.

CNET Instruction 1540.6, Training Appraisal Subsystem; Establishment of Curriculum and Instructional Standards (CIS) Offices/Departments, 11 July 1975. Chief of Naval Education and Training, NAS, Pensacola, FL 32508.

CNET Instruction 1550.1B (Draft), Instructional Systems and Program Development; Procedures and Responsibilities, no date. Chief of Naval Education and Training, NAS, Pensacola, FL 32508.

CNET Instruction 1550.15, Instructional Program Development Centers (IPDCs); Policy and Guidance for, 29 May 1980. Chief of Naval Education and Training, NAS, Pensacola, FL 32508.

CNET Instruction 1550.15A (Draft), Instructional Program Development; Policy and Guidance, no date. Chief of Naval Education and Training, NAS, Pensacola, FL 32508.

CNET Staff Instruction 5400.1F, Staff Organization Manual, 15 December 1980. Chief of Naval Education and Training, NAS, Pensacola, FL 32508.

CNTECHTRA Instruction 1540.40, Curriculum and Instructional Standards Office (CISO), 3 January 1979. Chief of Naval Technical Training, NAS, Memphis, Millington, TN 38054.

CNTECHTRA Staff Instruction 5400.2D, Staff Organization, 11 August 1978. Chief of Naval Technical Training, NAS, Memphis, Millington, TN 38054.

Procedures for Instructional Systems Development. NAVEDTRA 110A, in press. Naval Education and Training Command, NAS, Pensacola, FL 32508.

GENERAL

Borgatta, E. F. and Jackson, D. J. (Ed.) Aggregate Data Analysis and Interpretation. Beverly Hills: Sage, 1980.

Hall, E. R. and Hughes, H. A Structured Interview Methodology for Collecting Training Feedback Information. TAEG Report No. 92, December 1980. Training Analysis and Evaluation Group, Orlando, FL 32813 (AD A097671)

REFERENCES (continued)

Hall, E. R., Lam, Karen, and Bellomy, Susan G. Training Effectiveness Assessment: Volume I: Current Military Training Evaluation Programs. TAEG Report No. 39, December 1976. Training Analysis and Evaluation Group, Orlando, FL 32813 (AD A036517)

Hull, C. H. and Nie, N. H. SPSS Update. New York: McGraw-Hill, 1979.

Kendall, M. G. Rank Correlation Methods. (3rd ed.) London: Charles Griffin and Co., 1962.

Kenny, D. A. Correlation and Causality. New York: John Wiley & Sons, 1979.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., and Bent, D. H. Statistical Package for the Social Sciences. (2nd ed.) New York: McGraw-Hill, 1975.

Nunnally, J. C. Psychometric Theory. New York: McGraw-Hill, 1978.

Scheffe, H. The Analysis of Variance. New York: McGraw-Hill, 1959.

APPENDIX A

CURRICULUM AND INSTRUCTIONAL STANDARDS OFFICE FUNCTIONS

This appendix lists functions which CISOs are expected to perform. The functions were compiled from current higher authority instructions and from local CISO and CNTECHTRA staff suggestions.

CURRICULUM AND INSTRUCTIONAL STANDARDS OFFICE FUNCTIONS

Functions which CISOs are expected to accomplish are listed below. The list is divided into three parts. Functions 1 through 97 are those assigned CISOs by CNET Instruction 1540.6 and CNTECHTRA Instruction 1540.40. Functions 98 through 106 were suggested for CISO accomplishment by local staff at the Naval Submarine School. Functions 107 through 125 were suggested by CNTECHTRA staff.

Functions whose numbers are preceded by an "X" are those which for various reasons the TAEG project staff considered inappropriate for CISO accomplishment in the future. In some instances they represent subfunctions which need not be separately stated. Functions retained for consideration as future CISO tasks are preceded by other letter codes. The functions retained, were grouped according to the following letter codes:

A - Curriculum Design/Redesign

B - Instructional Support

C - Evaluation

D - Administrative

E - Special Training Support

In most instances where functions were considered inappropriate for CISOs, the activity or activities recommended for the function is identified in parentheses as follows:

(TD) - Training Department

(TPC) - Training Program Coordinator

(Admin) - Administrative Section

(CNTECHTRA) - Chief of Naval Technical Training

(CO) - Training Activity Commanding Officer

CURRICULUM AND INSTRUCTIONAL STANDARDS OFFICE FUNCTIONS

CNETINST 1540.6 and CNTECHTRAINST 1540.40

X1. Monitor procurement of training devices (TPC)

X2. Monitor assignment of training devices (TPC/TD)

X3. Monitor maintenance of training devices (TD)

A4. Review and approve all locally produced training publications

X5. Develop plans for activating emergency Navy curricula (TPC/TD)

X6. Work with CMI systems manager for CMI course development and implementation (TPC)

X7. Monitor development and maintenance of CMI course files (TPC/TD)

D8. Provide liaison with fleet activities and other training units

E9. Provide continuity for the command on all curriculum and instructional programs and evaluation efforts

E10. Monitor current developments in training methodology, technology, and research

X11. Recommend improvements in plans, policies, or techniques (not uniquely CISO)

B12. Conduct inservice in curriculum design, instructional delivery systems, and internal evaluation

A13. Task analysis

A14. Review curricula

A15. Revise curricula

A16. Approve curricula

A17. Design course materials

A18. Monitor writing of learning objectives

A19. Select instructional delivery systems

A20. Review curriculum control documents

X21. Acquire course documentation
X22. Maintain course documentation
X23. Acquire course approval data
X24. Maintain course approval data

} Part of Normal Review

A25. Revise courses based on evaluation

X26. Monitor administration of Navy Training Plans (TPC)

X27. Monitor implementation of Navy Training Plans (TPC)

E28. Conduct research projects and studies in training areas (CNTECHTRA)

A29. Develop curricula

A30. Develop training materials

A31. Review courses

X32. Assure adherence to applicable instructions (CO)

X33. Forward revised curricula to functional commanders for approval (CO)

X34. Visit classrooms (Step in doing other functions)

C35. Evaluate instruction

C36. Debrief newly assigned instructors

B37. Develop instructor inservice training

X38. Supervise instructor inservice training (TD with CISO in support role)

X39. Maintain central technical library (TD)

X40. Maintain course curriculum model (TD)

X41. Maintain bank of test items (TD)

X42. Prepare examinations (TD)

C43. Analyze test data

C44. Improve test items

C45. Prepare internal feedback instruments

C46. Prepare external feedback instruments

C47. Supervise feedback data collection

C48. Supervise feedback data analysis

C49. Supervise feedback interpretation and reporting

X50. Prepare Training Appraisal Plans (TAPs) (No longer required)

X51. Monitor implementation of approved TAPs (No longer required)

X52. Update TAPs (No longer required)

C53. Prepare student critique program

C54. Administer student critique program

C55. Summarize evaluation data

C56. Disseminate evaluation data

C57. Monitor attrition data

C58. Study causes of attrition

C59. Develop plans to reduce attrition

C60. Monitor setback data

C61. Study causes of setbacks

C62. Develop plans to reduce setbacks

C63. Standardize student critiques

C64. Standardize course reviews

X65. Standardize classroom visits (Requirement not clear)

X66. Coordinate course reviews (TPC/TD - Scheduling(?))

X67. Coordinate classroom visits (TD)

C68. Evaluate instructors

X69. Evaluate learning supervisors (Part of 68)

C70. Evaluate course review procedures

X71. Standardize graduate questionnaires (No longer a school requirement)

X72. Standardize supervisor questionnaires (No longer a school requirement)

C73. Standardize information from follow-on schools

C74. Standardize information from instructors returning from the fleet

C75. Standardize information from students returning from fleet

C76. Standardize information from other activities

} Subsumed under other functions

C77. Coordinate administration of internal feedback data collection

X78. Coordinate administration of supervisor questionnaires (No longer done)

X79. Coordinate administration of information from follow-on schools (Not clear)

X80. Coordinate administration of information from instructors returning from fleet (Not clear)

X81. Coordinate administration of information from students returning from fleet (Not clear)

X82. Coordinate administration of information from other activities (Not clear)

C83. Forward outstanding methods for obtaining feedback to CNTECHTRA

X84. Standardize data from training departments on student/instructor ratios (TD/Admin)

X85. Standardize data from training departments on instructor utilization (TD/Admin)

X86. Standardize data from training departments on class size (TD/Admin)

X87. Standardize data from training departments on convening frequency (TD/Admin)

X88. Analyze master schedules (TD/Admin)

X89. Analyze master schedule data analysis worksheets (TD/Admin)

X90. Analyze student instructor ratios (TD/Admin)

X91. Analyze instructor utilization reports (TD/Admin)

B92. Train personnel in training departments and courses

C93. Evaluate training departments' inservice programs (If training is not done by CISO)

X94. Schedule annual course reviews (TPC/TD)

X95. Provide course review schedules to CNTECHTRA (TPC/TD)

C96. Acquire data on instructor qualifications (As necessary)

C97. Maintain data on instructor qualifications (As necessary)

U.S. Naval Submarine School

E98. Attend/Monitor all pilot courses

X99. Conduct special projects (e.g., Manpower Survey, Accounting Feedback Reports)

B100. Establish/Monitor Remediation Courses

C101. Direct Master Training Specialist Program

C102. Direct Instructor of the Quarter Program

B103. Direct/guide specialized training/responsive training

C104. Review all student critiques

X105. Head civilian review board (CO)

X106. Coordinate instructor utilization program and make reports (TD)

CNTECHTRA Staff Suggestions

C107. Review instructional development process/instructional materials/supporting audit trail materials from: IPDCs, Contract Training Curricula, and Instructors

X108. Monitor ACRs and ensure action is taken for inadequacies (Included in other areas)

A109. Advise/assist curricula developers with the integration of special areas such as PQS, 3M, Safety

C110. Sample for trends established by end of course student critiques

C111. Conduct instructional programs in the areas of review and testing procedures and test results

D112. Review local training instructions for currency and compliance with higher authority instructions

X113. Distribute higher authority instructions (Admin)

B114. Ensure and assist inservice training

A115. Coordinate interservice training requirements relative to curricula

B116. Offer special assistance for workshops on curricula development which cross school lines, require special SMEs, have specified time limits

D117. Coordinate accreditation requirements and review

X118. Act as administration unit for the training instruction department (recommended for deletion by CNTECHTRA staff)

X119. Act as advisor for Course Curriculum Model Manager (CCMM) in control or management (TD/TPC)

X120. Coordinate review of Navy Training Plans (TPC)

X121. Evaluate/analyze feedback (covered elsewhere)

C122. (Desirable--not mandatory) Advise and assist the schoolhouse on external appraisal programs for

a. Level I
b. Level II
c. Level III
d. Instructor returning from fleet

D123. Act as sponsor for CNTECHTRA representative

D124. Coordinate and stage relevant IR requests, research subject requests, special studies, seminars, etc.

D125. Recommend candidates for Master Training Specialist Designation

APPENDIX B

SAMPLE QUESTIONNAIRE PACKAGE

This appendix contains a copy of the cover letter and two of the four questionnaires used to obtain information for this study. The short form questionnaire for commanding officers and executive officers is virtually identical to the short form questionnaire sent to CIS officers and training department heads. Therefore, a copy of these two questionnaires is not included in this appendix. Minor changes in wording were made to reflect the different positions of the recipients.

From: Director, Training Analysis and Evaluation Group
To: Commanding Officer

Subj: Curriculum and Instructional Standards Office Study

Ref: (a) CNET ltr N-53 of 25 June 1980 (NOTAL)

Encl: (1) CIS Office Survey for Commanding Officers or Executive Officers
*(2) CIS Office Survey for Training Department Heads/Regimental Commanders
*(3) CIS Office Survey for CIS Officer
(4) CIS Office Survey for All CISO Personnel

1. At the request of the Chief of Naval Technical Training, the Training Analysis and Evaluation Group (TAEG) has been tasked (reference (a)) to conduct a short term study of the Curriculum and Instructional Standards Office (CISO) concept. Your assistance is requested for this effort.

2. The CNET tasking requires that the TAEG assess current CISO capabilities for performing various training development, support, and evaluation functions. For this, both factual and opinion data are needed from local school personnel who either perform CIS Office duties or who are directly affected by CISO operations/requirements.

3. Enclosures (1) through (4) contain survey forms designed for obtaining required information. It is requested that these forms be distributed to individuals occupying billets/positions identified on each cover sheet. To preserve anonymity of respondents and to promote candid responses and comments, it is requested that individuals complete the forms independently and return them directly to the TAEG in the envelopes provided. Completed forms should be returned within 10 working days after receipt.

*Not included in this appendix.

CIS OFFICE SURVEY

for

Commanding Officers
or
Executive Officers

This form should be completed by either the CO or the XO of your activity. Please indicate below who completed the form.

Commanding Officer _____ Date _____

Executive Officer _____

Enclosure (1)

CIS Office Survey for Commanding or Executive Officers

I. The column on the left is a list of functions that might be performed in support of training. In the column below, rank the functions by placing a 1 by the function that you think is most important to assure training quality, a 2 by the next most important, and so on. If you think a function need not be performed, place a Ø by it.

II. The section below deals with where the responsibility for the function should be located. Within each row, order the alernatives by placing a 1 under the activity that you think should have primary responsibility for the corresponding function, a 2 under the activity that should have secondary responsibility, and so on. Your assignment of responsibilities need not reflect current assignment; rather, your assignment should reflect what you think would be the optimum assignment of responsibilities for each function, without regard for current resource limitations

FUNCTIONS	Order of priority	a CIS Office	b Training Department	c CNET	d CNTT	e IPDC	f Other
1. Curriculum development	___	___	___	___	___	___	(_____)
2. Curriculum revision	___	___	___	___	___	___	(_____)
3. Instructor training	___	___	___	___	___	___	(_____)
4. Internal evaluation	___	___	___	___	___	___	(_____)
5. External evaluation	___	___	___	___	___	___	(_____)
6. Test development and revision	___	___	___	___	___	___	(_____)
7. Guidance and counseling of instructors	___	___	___	___	___	___	(_____)
8. Standardization	___	___	___	___	___	___	(_____)
9. Instructor evaluation	___	___	___	___	___	___	(_____)
10. Administrative support of training command	___	___	___	___	___	___	(_____)
11. Ensure appropriate use of evaluation results	___	___	___	___	___	___	(_____)
12. Other _____	___	___	___	___	___	___	(_____)

III. Please answer the following questions by checking the most appropriate response.

a. All in all, how satisfied are you with the CISO concept as a mechanism for assuring training quality at the schoolhouse level?

Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
(1)	(2)	(3)	(4)	(5)

b. To what extent does the CIS Office in your command make positive contributions to the achievement of training quality in your command?

To a very small extent	To a small extent	To a moderate extent	To a great extent	To a very great extent
(1)	(2)	(3)	(4)	(5)

c. How effective is your CIS Office at doing the job it is supposed to do?

Not at all effective	Somewhat effective	Moderately effective	Very effective	Extremely effective
(1)	(2)	(3)	(4)	(5)

d. How great an impact would the elimination of the CIS Office from your command have on the quality of training, provided that the current CIS Office billets and positions remained available to your command?

No impact	Little impact	Some impact	Considerable impact	A great deal of impact
(1)	(2)	(3)	(4)	(5)

e. Please use the space below to make any additional comments or suggestions.

TAEG Report No. 110

CIS OFFICE SURVEY

for

All CISO Personnel

The Training Analysis and Evaluation Group (TAEG), at the request of CNET and CNTECHTRA, is conducting a study of CIS Offices. This survey is part of that study.

This survey is to be filled out by all personnel assigned to CISO duties by the local command. Individual responses will not be disclosed to anyone outside the TAEG. All data will be summarized in appropriate tables or charts.

Date _____

Enclosure (4)

TAEG Report No. 110

CURRICULUM AND INSTRUCTIONAL STANDARDS OFFICE SURVEY

Instructions

This survey form is intended for all Curriculum and Instructional Standards Office personnel occupying designated CIS Office billets or positions. The form is divided into five sections. Complete the form independently of other personnel. Brief instructions for each section are given below.

Section I. This section asks for information concerning your educational and work background. Answer each question to the best of your ability.

Section II. This section concerns resources that CIS Offices may need to carry out their functions. You are asked to make judgments about priorities and usefulness. Please give your best estimates.

Section III. This section asks you about your contacts and communications with other CISO personnel and with personnel outside the CIS Office. When asked for average frequency of contact, please choose the answer that is most accurate.

Sections IV and V. These two sections deal with functions that CIS Offices may perform. The functions listed are identical in both sections, but the questions across the top are different in each section. Please read the questions across the top and answer each question for each function. Answer the questions from the point of view of what you personally do as a member of the CIS Office.

After you have completed the form, please place it in the addressed envelope and return it directly to:

Director
Training Analysis and Evaluation Group
Naval Training Center
Orlando, FL 32813

Attn: CISO study

TAEG Report No. 110

CURRICULUM AND INSTRUCTIONAL STANDARDS OFFICE SURVEY

SECTION I. Respondent Data

a. Series (civilian) or NEC/NOBC - __ __ __ __

b. Grade (civilian) or rate/rank - _____

c. Current position or billet title - _____

d. Number of years/months in current position - __ __ / __ __

e. Anticipated length of stay in current position in years/months - __ __ / __ __

Educational Profile

f. What is the highest educational level you have attained? (check one)

(1) did not graduate from high school
(2) high school diploma or G.E.D.
(3) some college or technical training beyond high school, but not bachelor's degree
(4) graduated from college (B.A., B.S., or other bachelor's degree)
(5) some graduate school but no graduate degree
(6) Master's degree
(7) Ed.S., Ed.D., Ph.D., or other post master's or professional degree

g. If you received a bachelor's degree, put a 1 by the response that indicates your major and a 2 by the response that indicates your minor.

___ (1) Education
___ (2) Social science (psychology, sociology, etc.)
___ (3) Technical or scientific (math, physics, engineering, etc.)
___ (4) Business administration
___ (5) Other (specify) _____
___ (6) Other (specify) _____

h. If you received a graduate degree, put a 1 by the response that indicates your major and a 2 by your minor.

___ (1) Education
___ (2) Social Science
___ (3) Technical or scientific
___ (4) Business administration
___ (5) Other (specify) _____
___ (6) Other (specify) _____

i. What is the approximate total number of semester hours of graduate credit that you have accumulated in education?

___ ___ ___

j. What is the approximate total number of semester hours of undergraduate credit that you have accumulated in education?

___ ___ ___

If applicable, indicate approximately how many hours of study you have accumulated in the following areas?

		University level semester hours	Military classroom contact hours
k.	Instructional and curriculum design	__ __ __	__ __ __
l.	Education psychology -	__ __ __	__ __ __
m.	Tests and Measurement -	__ __ __	__ __ __
n.	Instructional systems design or NAVEDTRA 106A/110	__ __ __	__ __ __
o.	Evaluation research -	__ __ __	__ __ __
p.	Educational or training administration -	__ __ __	__ __ __
q.	Teaching/instructional methods or practicum -	__ __ __	__ __ __

r. Other (specify - _____)

If you have served, or are serving, in the military, approximately how many military classroom contact hours have you accumulated in the following areas?

s. IT school - __ __ __

t. Management Seminars - __ __ __

u. Training Seminars - __ __ __

v. Please list any other formal or informal training or experience you have acquired that you feel is relevant to your current assignment.

_____

_____

_____

SECTION II. CISO Resource Requirements

If increases in the following resources could be made to your CISO, in what priority do you think such increases should be made? Place a 1 by the most important, a 2 by the next, and so on.

a. __ Number of personnel

b. __ Skill and training of personnel

c. __ Available materials

d. __ Available equipment

e. __ Available money

f. __ Other (specify - _____)

For you to perform effectively in your current position, how useful would short courses or seminars in the following areas be?

	NOT AT ALL USEFUL	SLIGHTLY USEFUL	SOMEWHAT USEFUL	VERY USEFUL	EXTREMELY USEFUL
g. Curriculum Writing	(1)	(2)	(3)	(4)	(5)
h. Course Evaluation	(1)	(2)	(3)	(4)	(5)
i. Instructor Evaluation	(1)	(2)	(3)	(4)	(5)
j. Instructional Design	(1)	(2)	(3)	(4)	(5)
k. Test Development	(1)	(2)	(3)	(4)	(5)
l. Interview Techniques	(1)	(2)	(3)	(4)	(5)
m. Task Analysis	(1)	(2)	(3)	(4)	(5)
n. Instructional Techniques	(1)	(2)	(3)	(4)	(5)
o. Other	(1)	(2)	(3)	(4)	(5)

p. How many courses do you service as a CISO personnel?

___

Please make any additional comments or suggestions in the space below.

SECTION III. CISO Contacts and Communications

1. During the performance of your official CISO functions, with what positions inside the CISO do you have regular contact, formal or informal?

2. On the average, how often do you contact the people in these positions?

3. Please check the responses that best describe the nature or content of your contacts with the people in these positions?

	2. Daily (1)	Weekly (2)	Monthly (3)	Every 3 months (4)	Every 6 months or less (5)	Never (6)	3. Requests for information/advice sent (1)	Requests for information/advice received (2)	Requests for assistance sent (3)	Requests for assistance received (4)	Tasking sent (5)	Tasking received (6)	Administrative support sent (7)	Administrative support received (8)	Technical support sent (9)	Technical support received (Ø)
a. CIS Officer	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
b. Deputy CIS	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
c. Evaluation Branch Head	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
d. CIS Branch Head	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
e. Other																
_____	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
_____	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
With what positions outside the CISO do you have regular contact, formal or informal?	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
f. CO/XO	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
g. CNTECHTRA (016)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
h. Training Department Heads/ Regimental Commanders	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)
i. TPC's Instructors Other																
_____	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(Ø)

CISO FUNCTIONS SECTION IV	A. Check the response that best describes your involvement with each function listed. Not involved Monitor those who do it Advise those who do it Participate in performance Supervise those who do it Do it alone	B. On the average, how often do you perform each function? Daily Weekly Monthly Every 3 months Every 6 months Yearly or less Never	C. For the functions you are involved with, check the response that best describes the amount of effort you put in. A very slight amount A slight amount A moderate amount A considerable amount A great amount Not involved at all
I. Curriculum and Instructional Support			
a. Review course and curricula data and documentation	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
b. Do task analysis	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
c. Develop curricula	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
d. Design/Revise courses/curricula	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
e. Develop training materials/aids	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
f. Monitor developments in training technology to recommend improvements in training	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
g. Select instructional delivery systems	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
h. Develop/conduct inservice training	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
i. Maintain central technical library	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
j. Please list any additional major Curriculum and Instruction Support functions you perform and answer the questions for each additional function. 1. _____ _____ _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)

CISO FUNCTIONS SECTION IV (con't)	A. Check the response that best describes your involvement with each function listed. Not involved Monitor those who do it Advise those who do it Participate in performance Supervise those who do it Do it alone	B. On the average, how often do you perform each function? Daily Weekly Monthly Every 3 months Every 6 months Yearly or less Never	C. For the functions you are involved with, check the response that best describes the amount of effort you put in. A very slight amount A slight amount A moderate amount A considerable amount A great amount Not involved at all
2. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
3. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
II. Evaluation			
a. Prepare examinations	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
b. Analyze test data	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
c. Maintain test item bank	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
d. Develop internal feedback instruments/procedures	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
e. Develop items for external feedback instruments	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
f. Analyze and interpret feedback data	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
g. Study attrition	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
h. Study setbacks	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
i. Administer student critique program	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)

CISO FUNCTIONS

SECTION IV (con't)

A. Check the response that best describes your involvement with each function listed.

(1) Not involved
(2) Monitor those who do it
(3) Advise those who do it
(4) Participate in performance
(5) Supervise those who do it
(6) Do it alone

B. On the average, how often do you perform each function?

(1) Daily
(2) Weekly
(3) Monthly
(4) Every 3 months
(5) Every 6 months
(6) Yearly or less
(Ø) Never

C. For the functions you are involved with, check the response that best describes the amount of effort you put in.

(1) A very slight amount
(2) A slight amount
(3) A moderate amount
(4) A considerable amount
(5) A great amount
(Ø) Not involved at all

	A	B	C
j. Evaluate instructors, including contract instructors	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
k. Evaluate training department inservice programs	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
l. Conduct annual course review	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
m. Conduct special research projects	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
n. Please list any additional major evaluation functions you perform and answer the questions for each function.			
1. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
2. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
3. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)

CISO FUNCTIONS

SECTION IV (con't)

A. Check the response that best describes your involvement with each function listed.

(1) Not involved
(2) Monitor those who do it
(3) Advise those who do it
(4) Participate in performance
(5) Supervise those who do it
(6) Do it alone

B. On the average, how often do you perform each function?

(1) Daily
(2) Weekly
(3) Monthly
(4) Every 3 months
(5) Every 6 months
(6) Yearly or less
(Ø) Never

C. For the functions you are involved with, check the response that best describes the amount of effort you put in.

(1) A very slight amount
(2) A slight amount
(3) A moderate amount
(4) A considerable amount
(5) A great amount
(Ø) Not involved at all

	A	B	C
III. Administration			
a. Coordinate inter-service training requirements	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
b. Coordinate inter-departmental training activities	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
c. Please list any additional major evaluation functions you perform and answer the questions for each function.			
1. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
2. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
3. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)

CISO FUNCTIONS SECTION IV (con't)	A. Check the response that best describes your involvement with each function listed. Not involved Monitor those who do it Advise those who do it Participate in performance Supervise those who do it Do it alone	B. On the average, how often do you perform each function? Daily Weekly Monthly Every 3 months Every 6 months Yearly or less Never	C. For the functions you are involved with, check the response that best describes the amount of effort you put in. A very slight amount A slight amount A moderate amount A considerable amount A great amount Not involved at all
IV. Additional Functions			
a. In the spaces below, write in any additional functions that you perform that do not appear above.			
1. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
2. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)
3. _____	(1) (2) (3) (4) (5) (6)	(1) (2) (3) (4) (5) (6) (Ø)	(1) (2) (3) (4) (5) (Ø)

SECTION V

CISO FUNCTIONS	D. For each function with which you are involved, how much impact would there be on the quality of courses if this function were no longer performed by CISO personnel? (1) No impact (2) Little impact (3) Some impact (4) Considerable impact (5) A great deal of impact	E. Would the impact of the elimination of this function be positive or negative? (1) Positive (2) Negative	F. If you are not involved in the performance of a function, check all reasons that apply. (1) Too few personnel (2) Staff lacks skill or training (3) Unnecessary or undesirable (4) Lack of funds (5) Lack of materials or equipment (6) Someone else does it. Who? _____ (7) Other (specify) _____
I. Curriculum and Instructional Support			
a. Review course and curricula data and documentation	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
b. Do task analysis	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
c. Develop curricula	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
d. Design/revise courses/curricula	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
e. Develop training materials/aids	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
f. Monitor developments in training technology to recommend improvements in training	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
g. Select instructional delivery systems	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
h. Develop/conduct inservice training	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
i. Maintain central technical library	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
j. Please list any additional major Curriculum and Instruction Support functions you perform and answer the questions for each additional function. 1. _____ _____ _____	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) ____

CISO FUNCTIONS SECTION V (con't)	D. For each function with which you are involved, how much impact would there be on the quality of courses if this function were no longer performed by CISO personnel? No impact Little impact Some impact Considerable impact A great deal of impact	E. Would the impact of the elimination of this function be positive or negative? Positive Negative	F. If you are not involved in the performance of a function, check all reasons that apply. Too few personnel Staff lacks skill or training Unnecessary or undesirable Lack of funds Lack of materials or equipment Someone else does it. Who? Other (specify)
2. _____			
3. _____			
II. Evaluation			
a. Prepare examinations	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
b. Analyze test data	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
c. Maintain test item bank	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
d. Develop internal feedback instruments/ procedures	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
e. Develop items for external feedback instruments	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
f. Analyze and interpret feedback data	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
g. Study attrition	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
h. Study setbacks	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
i. Administer student critique program	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
j. Evaluate instructors, including contract instructors	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____

SECTION V (con't)

CISO FUNCTIONS	D. For each function with which you are involved, how much impact would there be on the quality of courses if this function were no longer performed by CISO personnel? (No impact; Little impact; Some impact; Considerable impact; A great deal of impact)	E. Would the impact of the elimination of this function be positive or negative? (Positive; Negative)	F. If you are not involved in the performance of a function, check all reasons that apply. (Too few personnel; Staff lacks skill or training; Unnecessary or undesirable; Lack of funds; Lack of materials or equipment; Someone else does it. Who?; Other (specify))
k. Evaluate training department inservice program	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
l. Conduct annual course review	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
m. Conduct special research projects	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
n. Please list any additional major evaluation functions you perform and answer the questions for each function.			
1. _____	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7) _____
2. _____	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____
3. _____	(1) (2) (3) (4) (5)	(1) (2)	(1) (2) (3) (4) (5) (6)_____(7)_____

SECTION V (con't)

CISO FUNCTIONS

C. For each function with which you are involved, how much impact would there be on the quality of courses if this function were no longer performed by CISO personnel?

No impact
Little impact
Some impact
Considerable impact
A great deal of impact

E. Would the impact of the elimination of this function be positive or negative?

Positive
Negative

F. If you are not involved in the performance of a function, check all reasons that apply.

Too few personnel
Staff lacks skill or training
Unnecessary or undesirable
Lack of funds
Lack of materials or equipment
Someone else does it. Who?
Other (specify)

III. Administration

a. Coordinate inter-service training requirements (1) (2) (3) (4) (5) (1) (2) (1) (2) (3) (4) (5) (6)_____(7)_____

b. Coordinate inter-departmental training activities (1) (2) (3) (4) (5) (1) (2) (1) (2) (3) (4) (5) (6)_____(7)_____

c. Please list any additional major evaluation functions you perform and answer the questions for each function.

1. _____
_____
_____
(1) (2) (3) (4) (5) (1) (2) (1) (2) (3) (4) (5) (6)_____(7)_____

2. _____
_____
_____
(1) (2) (3) (4) (5) (1) (2) (1) (2) (3) (4) (5) (6)_____(7)_____

3. _____
_____
_____
(1) (2) (3) (4) (5) (1) (2) (1) (2) (3) (4) (5) (6)_____(7)_____

CISO FUNCTIONS

SECTION V (con't)

D. For each function with which you are involved, how much impact would there be on the quality of courses if this function were no longer performed by CISO personnel?

No impact
Little impact
Some impact
Considerable impact
A great deal of impact

E. Would the impact of the elimination of this function be positive or negative?

Positive Negative

IV. Additional Functions

a. In the spaces below, write in any additional functions that you perform that do not appear above.

1. _____

_____

_____

(1) (2) (3) (4) (5) (1) (2)

2. _____

_____

_____

(1) (2) (3) (4) (5) (1) (2)

3. _____

_____

_____

(1) (2) (3) (4) (5) (1) (2)

APPENDIX C

OTHER SERVICES' APPROACHES TO ENSURING TRAINING QUALITY

This appendix presents information concerning training quality assurance policies and practices of the Army and the Air Force.

OTHER SERVICES' APPROACHES TO ENSURING TRAINING QUALITY

During the study, visits were made to selected Army and Air Force activities to obtain information concerning these services' philosophy, policies, and practices regarding quality assurance of training. Informal interviews were conducted with personnel in various offices and departments, and copies of printed materials bearing on relevant issues were obtained. No attempt was made to acquire a complete understanding of these other training systems. Rather, the intent was to obtain information concerning particular concepts employed for quality assurance of training, the manner in which they have been implemented, and the relative degree of success of the concepts and their implementation.

A variety of information was obtained concerning the performance of functions comparable to those expected of Navy CISOs. This information was used as input to both a comparative evaluation of Navy CISOs and to the development of recommendations for the future Navy performance of operations to enhance training quality. Relevant features of Army and Air Force training quality assurance considerations are described below.

ARMY

Information about Army quality assurance concepts was obtained through visits to the following activities:

- Hqs, Army Training and Doctrine Command, Ft. Monroe, VA
- Army Training Management Institute, Ft. Eustis, VA
- Army Transportation School, Ft. Eustis, VA
- Army Infantry School, Ft. Benning, GA
- Army Aviation Center, Ft. Rucker, AL.

Army concern for training quality is reflected in the organization of Army schools. Information concerning this school organization is presented below. Also discussed are policy considerations that affect aspects of Army training quality assurance practices.

SCHOOL ORGANIZATION. Quality assurance is an integral consideration of the Army training system. This is reflected in the model school organization established by the Army's Training and Doctrine Command. The typical Army school has four Type Directorates. Each Directorate, generally headed by an O-6 but occasionally an O-5, reports directly to an (the) assistant commandant at a school. Subject matter experts are typically assigned to each Directorate. Even though there is a prescribed model, local commandants do have latitude in deciding how best to perform functions assigned, and organizational variations are also permitted.

The functions assigned three of the Directorates are based on the first five phases of the Interservice Review Organization (ITRO) Instructional Systems Development (ISD) Model as shown below:

DIRECTORATE	ISD PHASE
• Training Developments (DTD)	Analyze, Design, Develop
• Training and Doctrine (DOTD)	Implement
• Evaluation and Standardization (DES)	Evaluate

The duties, responsibilities, and practices of these three Directorates are discussed below. The fourth Type Directorate, Combat Developments, is also discussed.

Directorate of Training Developments. Directorates of Training Developments (DTD) are generally charged with developing training programs and products. Through completion of the analysis, design, and development phases of ISD, DTDs are specifically to develop resident, nonresident, and collective (unit) training.

Local DTDs conduct task analytic efforts to define job performance requirements for those Army specialties under the cognizance of a given school. In the process of defining job performance requirements, local DTDs provide inputs to the Soldier's Manual and to the Commander's Manual. These inputs consist of statements of the tasks requiring performance for a given specialty plus conditions and standards for each level of a Military Occupational Specialty (MOS). The Soldier's Manual is an important element in training quality control. It guides both training development and evaluation. The Commander's Manual, which is used by field commanders, also lists the tasks to be performed at various MOS levels. Further, it provides information concerning where and how to train these tasks. For example, the manual identifies correspondence or Training Extension Courses (TEC) that are available for particular training purposes.

Although a local DTD has nominal responsibility for all course development, there is variation in practice across the schools. At some schools, the training departments, not DTD, do necessary development work for existing courses. DTD does the development work only for new courses (e.g., courses required as a result of new equipment, changed tactics, or new doctrines). However, at other schools, DTDs may also be involved in the revision of existing courses.

The usual output of a DTD is a Program of Instruction (POI) which typically lists the recommended topics to be covered in training and the amount of time to be devoted to each. In some instances, POIs may also identify resource requirements and recommend where training should be conducted (i.e., institutional or unit training). Although a DTD may have primary responsibility for POIs for new courses, they are generally coordinated with or developed in conjunction with training departments. This may reflect a

reported (by local center staff) shortage of skilled manpower with a trend towards concentrating SMEs in the instructional departments.

For nonresident training, local DTDs produce correspondence courses and exportable training packages in areas for which a particular school is proponent. For example, the Army Aviation Center at Fort Rucker (AL) produces courses related to aviation (e.g., air traffic control), the Transportation School at Fort Eustis (VA) produces those related to auto mechanics. These courses are then taught at other locations where such training is needed. Currently, these exportable training packages consist principally of a POI (the contents of a POI were defined above) and do not necessarily contain instructor or student guides or testing materials, or instructional media. Generally, local DOTs develop the actual course including materials and necessary tests. To the extent that DTDs do not have their own assigned SMEs, development is again shared with training departments.

Directorate of Training and Doctrine. The Directorate of Training and Doctrine (DOTD) is the instructional arm of an Army school. In terms of the ISD model, the Directorate of Training implements the instructional system. As a result of a recent TRADOC decision (3 Oct 1980) the Directorate of Training also became responsible for establishing "Doctrine." Doctrine refers to how particular tasks shall be executed (e.g., Standard Operating Procedures for motor vehicles).

In actual practice, considerable curriculum development work is performed within the DOTDs. This appears to be primarily for existing courses and it reflects the current TRADOC's view that DOTD SMEs must have a greater hand in curriculum development than they have had in the past. (Reasons for this view are discussed subsequently in this section.)

Just as there are variations from the school model in the functions performed by Directorates, there are also allowed variations in the organizational structures at Army schools. For example, at the U.S. Army Infantry School at Fort Benning, Georgia, the training departments report to a Deputy Assistant Commandant. The DOTD has the specialized function of faculty development. The Armor School at Fort Knox, Kentucky, does not have a DOTD. The training departments report to the Director for School Activities. At Fort Rucker, the training departments do report to DOTD as suggested by the school model.

Based on a limited number of visits to Army activities, it appears that in the usual case the DOTDs do all necessary developmental work for existing courses with minimal, if any, assistance from the DTDs. The DOTDs also evaluate their own instructors and exercise primary responsibility for test development, course evaluation, and student critique programs.

As mentioned previously, proponent schools (the proponent school concept is similar to the Navy's Course Curriculum Model Manager Concept) develop courses in areas for which they are responsible. These training packages are then sent to other locations where there is a need to teach particular subjects (e.g., automobile mechanics). According to some recipients of such courses, the usual case is that the proponent school supplies only

broad objectives with hours to be spent on each (i.e., a POI). The actual course and course materials are developed at the local level by the concerned DOTD where due consideration is given to local factors that affect the type and design of the course that can be given. The local training departments usually also develop any tests that will be used with such courses.

Directorate of Evaluation and Standardization. The Directorate of Evaluation and Standardization (DES) at a local school is responsible for internal and external evaluation. The responsibility for standardization has recently been added.

According to TRADOC sources, internal evaluation, or quality assurance, essentially consists of determining that the local DOTD has a training program and that the program is implemented. Thus, internal evaluation is primarily an audit function. External evaluation refers to the determination of the extent to which the school meets the needs of units in the field. External evaluation involves the assessment of school products (e.g., unit training exercises) and school graduates.

Local schools may send questionnaires to field supervisors of school graduates to determine training adequacy and to highlight weaknesses in training or student readiness. At all schools, branch training teams conduct external evaluations. These teams, headed by the local DES, may be composed of personnel from all Directorates. The branch training teams periodically visit field units that receive students from the courses (or products) for which the school is proponent. These visits have two purposes: to inform field units of what the school does and to determine any inadequacies experienced in the field.

Practices at field units appear to reflect quite closely the notions described above. The Evaluation Division of DES at the USA Aviation Center, for example, has an internal evaluation branch and an external evaluation branch. The internal evaluation branch is concerned with evaluation of Instructional Systems Development practices within the Aviation Center. This branch, for selected courses, has examined the audit trail through the first 3 phases of ISD to ensure that ISD procedures were followed. Currently, the branch does "snapshot" evaluations; e.g., "visiting" courses, looking at documentation to see if objectives are consistent, effective.

The External Evaluation Branch is the coordinator for the Army Aviation Center Training Analysis and Assistance Team (AACTAT). This team visits Army installations worldwide to interview pilots and aviation enlisted personnel. They evaluate courses for which the Aviation Center is proponent. The External Evaluation Branch also routinely follows up (quarterly) graduates of five different courses taught at the center. A questionnaire based on the Job Task Inventory (JTI) from the course development effort is used for this. Other courses are done on an as-needed basis. No effort is expended to evaluate training extension courses (TEC) or correspondence courses, however.

It is understood that DESs at other Army schools function in quite similar ways to the Aviation Center DES. Fort Knox, however, does not have an equivalent to DES. Evaluation and standardization functions are performed

by the Office of Armor Force Management. The major emphasis of evaluation at all schools is product evaluation accomplished through visits to operating units and/or questionnaires to graduates and field commanders. Evaluation results are provided to the training departments for their use and final disposition. DES Branch teams, in addition to checking on graduate quality at field sites, also examine the appropriateness of instructional materials prepared by the schools for field use.

Directorate of Combat Developments. The fourth Type Directorate, the Directorate of Combat Developments (DCD), has primary responsibility at a school for assuring the integration of new hardware into field units. This directorate provides inputs to the other directorates who prepare, conduct, and evaluate required training.

POLICY CONSIDERATIONS. The Army Training and Doctrine Command (TRADOC) sets policies for implementation at the school level. Each of the divisions in a school has a counterpart at TRADOC. Thus, the Training Development Institute sets policies for the development of training programs at schools; the Training Management Institute (TMI) sets policies for implementation by Directorates of Training in schools; and the Evaluation Directorate at TRADOC sets policies for evaluation at the school level. Currently, the Evaluation Directorate performs primarily an audit function aimed at determining that local schools follow prescribed steps in the training development process.

Current indications are that several policy changes are imminent which will affect local schools' operations. During discussions with various Army personnel, at TRADOC and at local schools, several predictions and recommendations for changes in policy were repeated. There seems to be a general consensus that training development and implementation should be left to the discretion of the local school commandant. The emphasis in policy should be on the desired outcomes for a particular training program and on accountability for failure to provide training that results in those desired outcomes. Additionally, performance evaluation should occur prior to designing a training program to determine if the program is indeed necessary.

A consensus was expressed at Command levels that there is room for improvement in standardizing Army training. However, the current emphasis in standardization is on the process of training, not the outcome. This is contradictory with the philosophy of leaving as much control as possible to the local commandant. Suggestions concerning standardization converged on the concept of standardizing only the outcomes of training programs. Attempts to standardize the actual training process should be minimized, and the local commandant should have latitude to tailor the training program to suit local conditions.

In conjunction with a shift from standardization of process to standardization of outcomes, an increase in the accountability of the local commandant would be necessary. The local commandant would, in effect, be held responsible for ensuring that the products of his school were indeed satisfactory. For such accountability to be successful, there would have to be visible sanctions from higher authority if acceptable standards were not met.

It appears that training development functions are being shifted to the local DOTD level. Several reasons underlie this policy change. It is believed that the local instructors and SME's (i.e., DOT personnel) should have significant input into the curriculum development process since they know the most about the performance of a particular job. Further, instructors who participate in curriculum development will feel a sense of authorship and will be more willing to devote the necessary time and energy to make the training effective. If local instructors are not included, they will modify the curriculum anyway since they are the ones who must use it. Including them in development at the start will result in a better curriculum due to the pooling of their experience and expertise. Finally, the local instructors are more aware of local conditions than the proponent schools may be.

AIR FORCE

Information about Air Force training quality assurance policies and practices was obtained from visits to the following Air Force activities:

- Air Training Command, Randolph AFB, TX
- Standards and Evaluation Directorate, Randolph AFB, TX
- Occupational Measurement Center, Randolph AFB, TX
- 3200th Technical Training Wing, Lackland AFB, TX
- 3300th Technical Training Wing, Keesler AFB, MS

Information concerning Air Force performance of functions comparable to those expected of Navy CISOs is presented below. The Air Force school organization is presented first. This is followed by brief descriptions of key features of Air Force practices that are relevant to developing recommendations for Navy approaches to ensuring training quality.

SCHOOL ORGANIZATION. Air Force training is highly decentralized. The Air Training Command (ATC) establishes policies and monitors the schools for compliance. However, since 1977 responsibility for the quality of particular training courses has been vested at the local school level.

Air Force technical training is conducted under the aegis of Technical Training Wings located at various Air Force bases. Figure C-1 displays schematically selected elements of a typical Training Wing that are directly concerned with training. The Wing Commander reports to the Air Force Base Commander, who in turn reports to the ATC. Several specialized staff functions are placed at Wing level. Actual training is conducted within Technical Training Groups under the Wing. Duties and functions of selected organizational elements are briefly described below.

Wing Staff Functions. Relevant Wing staff functions are listed below.

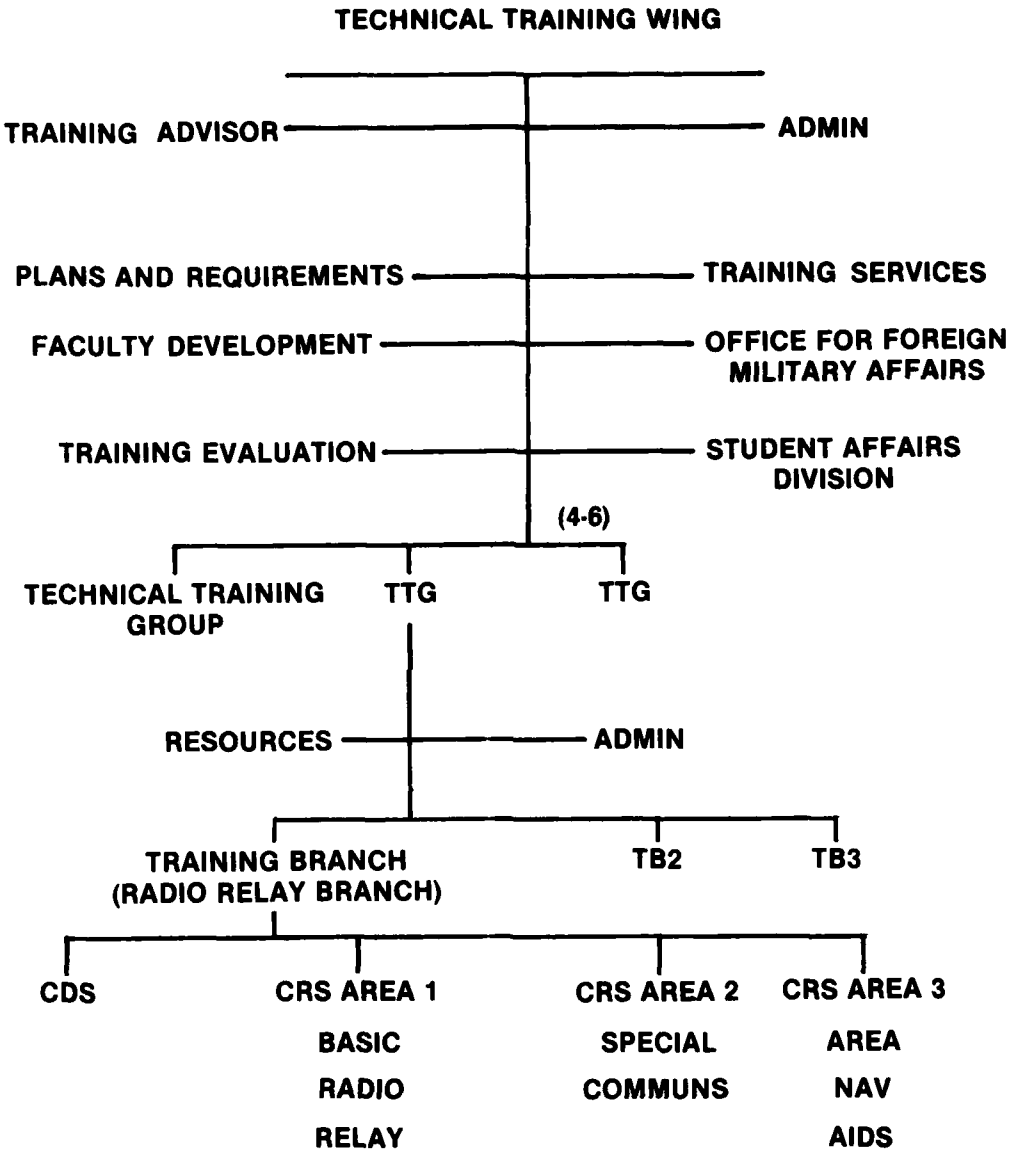

Figure C-1. Typical Air Force Technical Training Wing Organization

Training Advisor. The Training Advisor at the Wing level is the senior civilian training specialist (GS 1712 series--the GS 1710 series is rarely used by the Air Force) within the Wing. In addition to advising the Wing Commander about training matters, the training advisor serves as a direct liaison to various ATC activities and to major command users of graduates concerning changing user needs and problems.

Plans and Requirements Division. Career field training managers are located within the Plans and Requirements Division of a Wing. These individuals set the pattern for all training (formal institutional training, correspondence courses, and on-the-job (OJT) training) required to establish appropriate skills and knowledges across all levels of an Air Force job specialty. The Air Force emphasis is on planning/training for a total career field rather than on single courses of instruction given in isolation from the total career field.

Training Managers within a Wing's Plans and Requirements Division are typically GS-12 training specialists. They are directly responsible to the Air Force for particular courses of instruction given under the Wing. They exercise administrative and technical control over course(s). Training managers function in ways similar to Navy Training Program Coordinators. However, they have far greater authority and are located at the training activity level rather than within a headquarters group. Twenty Training Managers are placed at Keesler Air Force Base--one for each Air Force Specialty (AFS) served by this base.

Faculty Development Division. The Faculty Development Division at the Wing provides all training, both preservice and inservice, for new instructors reporting to the Wing. The model for instructor courses is designed at Sheppard Air Force Base. All enlisted instructors are required to receive 36 hours of inservice training annually. This may be given by the Faculty Development Division or within the particular training branch to which the instructor is assigned. All courses are required in order for an individual to receive the Master Instructor Certificate.

Training Evaluation Division. The Training Evaluation Division conducts external evaluations (via questionnaires or field visits) of courses for which the Wing is responsible. The division also assists the training branches in internal evaluation efforts (e.g., by preparing checklists).

Training Services Division. The Training Services Division produces training aids and provides word processing and other support to the training mission.

Office of Foreign Military Affairs. Special administrative and counseling support for foreign military students is provided by the Foreign Military Affairs Office.

Student Affairs Division. The Student Affairs Division contains student advisors and counselors. Counseling is given for both academic and nonacademic problems. However, particular academic problems are referred to appropriate instructional personnel in the Training Branches.

Technical Training Groups. Typically, four to six Technical Training Groups (TTG) are organized under the Training Wing. Technical training is accomplished by Training Branches within these Groups.

Training Branches. As shown in figure C-1, each TTG is composed typically of three Training Branches. In turn, the branches typically consist of a Curriculum Development Section (CDS) and three Course Areas. The CDS is specifically responsible for the development of curricula and instructional materials (e.g., student guides, instructor guides, tests, training aids) that will be used for the courses taught by the Branch. Instructors assigned to the Course Areas conduct the instruction in accordance with the CDS plans.

KEY FEATURES OF AIR FORCE TRAINING

Selected features of Air Force training of direct interest for training quality assurance are described below.

SPECIALTY TRAINING STANDARD. The Specialty Training Standard (STS) is a key document which is used by the Air Force as a firm basis for all training (schoolhouse, correspondence courses, and OJT) and testing for a given Air Force Specialty Code (AFSC).

An STS lists skills and knowledges needed for each level of an AFSC. It also specifies the level of knowledge and/or the level of performance proficiency required at each step of the AFSC. Thus, the STS entries identify specifically what is to be accomplished by training (and also define legitimate testing/evaluation items).

An STS may be initially compiled by the Training Manager who is concerned with a given AFSC. However, it is validated by surveys conducted by the Air Force Occupational Measurement Center (OMC). The OMC is a staff function of Headquarters ATC. The OMC surveys each Air Force specialty approximately every 4 years. In addition to other information, these surveys collect data from AFSC incumbents concerning their backgrounds, tasks performed, the amount of time spent on each task, and the frequency of task performance. The survey data is used for a variety of purposes. A principal use is to update the STS for the AFSC.

Training Managers at the schools may convene a Utilization and Training Workshop (UTW) to review survey data. The UTW is composed of representatives from the ATC and all major user commands. The UTW reviews the survey data to assess discrepancies between what is currently being trained and what jobs incumbents report they currently do. Difficulty of task performance is evaluated by the Subject Matter Specialists (SMS) at the UTW and decisions are made from the data about future training. Information concerning the number of respondents performing a particular task(s) is used in the following way:

- less than 30 percent performing a given task--no school training

- 30-50 percent performing a task--knowledge training only at the school
- 50 percent or more performing a task--hands-on performance training at the school.

Job tasks revealed by the survey to be required only for one major command are not routinely selected for formal training. Training for these tasks becomes the responsibility of that command. One product of the UTW is an updated STS for the AFSC of concern. The STS provides a basis for a contractual relationship between the school and the major user commands. It specifies what the school will train and to what level. It is the responsibility of the local Wing to ensure that school graduates meet the criteria specified in the STS.

Survey data, used in updating the STS, may signal the need for revisions to current training. The need for revisions to courses may also be signaled in other ways. For example, the Training Evaluation Division at the local Wing conducts periodic external training evaluations. These evaluations focus on specific items listed on an STS. To the extent that these evaluations determine that a school is not meeting its contractual obligations to the major commands, training must be adjusted. (Another possible outcome of such evaluations, however, may be a request for a new occupational survey to determine the STS validity.)

CURRICULUM DEVELOPMENT. The majority of required course development work occurs at the local Training Wing. The local wing is totally responsible for revisions of old courses. Course development for new weapons systems is the responsibility of the Air Training Command. The 3306th Test and Evaluation (T and E) Squadron (Edwards AFB, California) is specifically responsible within ATC for these developments. Subject Matter Specialists are recruited as needed from all over the Air Force, given a general course on ISD (the Air Force uses its own version of ISD as contained in Air Force Manual 50-2). They then assist in developing the required new course(s). The T and E Squadron, as a minimum, determines how the new weapons system is (to be) operated and maintained and establishes training requirements. This material may then be handed over to the appropriate Wing(s) for further, more detailed course development work. Certain new non-weapons system course development efforts may also be handled by ATC. Courses in this category remain under ATC control until it has been determined that they are functioning smoothly. Subsequently, they also are handed over to an appropriate Training Wing for maintenance.

Curriculum development at the Wing level is a multistage process. Initially, the Training Manager develops a Course Training Standard (CTS). The CTS, based on the STS for the AFSC, specifies the training to be given and the levels to which students will be trained. The Training Manager also develops a Course Chart showing event sequencing and course scheduling. These two items represent the basic control documentation for a course and they also are viewed as contractual (with user commands) items.

The CTS and Course Chart are subsequently given to the Curriculum Development Section (CDS) in the appropriate Group Training Branch. CDS then develops the course. Most often, instructors will be borrowed from a Course Area to assist in this effort. A GS-11 training specialist (or GS-9 temporarily promoted to GS-11) typically leads the ISD development team. CDS produces a detailed Plan of Instruction (POI) which states the learning objectives, student instructional materials, audio-visuals to be used, training methods, instructional guidance to be used, etc. Tests to be used for the course are also developed by CDS. Currently, there is no Air Force-wide requirement for comprehensive end-of-course testing. Testing usually occurs after each block (module) of instruction. The general policy on student testing is that every objective in the POI will be tested.

From the Branch CDS, the POI goes to the Course Area. Each instructor is then required to prepare his own individual lesson plan(s) specifying how he will conduct the training. These lesson plans may be reviewed by CDS, but most often these reviews are performed by the Chief Instructor.

Air Force general policy is to develop courses for group-paced instruction. According to ATC sources, only about 10 percent of Air Force instruction occurs under self-paced methods, and these are mostly advanced courses. A prevalent belief is that self-paced instruction is not as effective as group-paced instruction.

Minor revisions to courses which involve no changes to time or other resources can be approved by the Training Manager at the local Wing level. Revisions that require additional capital resources, greater time, or increased manpower can be approved by the local Wing Commander. However, to the extent that the necessary resources are not immediately available to implement the revisions, they must be solicited from the ATC.

EVALUATION FUNCTIONS

Most often, local Training Branches are not directly involved in collecting external evaluation information. This information is obtained in a variety of ways and is provided to the local Training Branches. Some external evaluation sources have been previously mentioned; greater detail on Air Force external evaluation programs is provided in Hall, et al. (1976).

Internal evaluation at local Air Force levels involves several functions similar to those expected of Navy CISOs; e.g., instructor evaluation, annual course reviews, student critiques. Instructor evaluations are conducted by instructor supervisors. In addition to assessing instructors' presentation of material, continuous staff surveillance is maintained to ensure that the individual instructor follows the POI. Annual Quality Reviews (AQR) are also conducted for each course. These reviews involve a self-audit of equipment, materials, and instructors. AQRs are done by the particular Course Area under the cognizance of the Branch CDS. The AQR format is prepared by the Wing Training Evaluation Division. The CDS schedules the review, ensures that the schedule is adhered to, and that all aspects of the course are examined. At least two individuals at the course level must sign that the AQR has been accomplished.

Each Course Area also administers a student critique program. This is handled by the training instructors. Students are provided opportunity to comment on the quality of the instruction they received. Periodically, student critiques are reviewed by higher authority at the Wing.

Test item analysis is accomplished within the Course Area. Each time, a test is given, the individual instructor must complete a test item analysis form which is reviewed by the instructor supervisor. These forms are then used to determine which items "are not working right." The instructor supervisor can recommend changes to tests at any time. Once per quarter, the Branch CDS reviews the test item analysis forms, and the supervisor's comments about particular items. As necessary, test items are rewritten by the course instructors with assistance from CDS.

APPENDIX D

FACTOR AND DISCRIMINANT FUNCTION ANALYSES OF CISO FUNCTIONS

This appendix presents the technical details of the factor and discriminant function analyses performed on data from the long questionnaire. The details are relevant to the types of functions CISOs perform and to the determination of different types of CISOs.

FACTOR AND DISCRIMINANT FUNCTION ANALYSES OF CISO FUNCTIONS

TYPES OF FUNCTIONS

The first step in determining a typology of CISOs was to examine the functions performed to find an underlying structure that would allow for the reduction of separate functions into groups. Principle components analysis without iterations was chosen because it allows for the presentation of single items or variables in components that are mathematically equivalent to the original items (Nunnally, 1978). The items used in the principle components analysis were from section IV of the long form. In subsection I, items a through i for question A were chosen; in subsection II, items a through n for question A were chosen (see appendix B). The five factors with eigenvalues greater than or equal to 1.0 were retained for Varimax rotation. The rotated 5-factor solution is shown in table D-1.

Based on an examination of the loadings in the rotated factor structure, there appear to be five fairly well defined factors. Four scales were created based on the four factors that have multiple high loadings. The first scale consists of the mean of items a through h in subsection II and is called EVAL1. The second scale consists of the mean of a through e in subsection I and is called CISWRK. The third scale consists of the mean of items f, g, h, k, and m in subsection I and is called CISDEV. The fourth scale consists of the mean of items j and l in subsection II and is called EVAL2. The fifth factor only has one strong loading from item a in subsection II. This item is used as a single item scale called TECLIB. The actual functions constituting these five scales are shown in table 5 in the text, page 31.

Internal consistency reliabilities were computed for the four multiple-item scales using coefficient alpha (Nunnally, 1978). EVAL1 had a reliability of 0.90; CISWRK had a reliability of 0.82; CISDEV had a reliability of 0.75; and EVAL2 had a reliability of 0.62.

Next, one-way ANOVA's were performed using the five scales, CISWRK, EVAL1, CISDEV, EVAL2, and TECLIB, as dependent variables and school identifying number as the independent factor. This analysis was performed to determine if the scales reflect characteristics about each CISO rather than about the individual respondents. If the F-ratio is significant, then that indicates that the scale measures a school-level characteristic (Borgatta and Jackson, 1980). Three of the scales, CISDEV, EVAL2, and TECLIB had significant F-ratios ($p < .05$). Thus, these three scales were used to determine if there were different types of CISOs with respect to involvement with functions.

TABLE D-1. VARIMAX ROTATED FACTOR LOADINGS OF DEGREE OF INVOLVEMENT WITH FUNCTIONS

	FACTORS				
FUNCTIONS	EVAL1	CISWRK	CISDEV	EVAL2	TECLIB
REVIEW COURSE AND CURRICULA DATA AND DOCUMENTATION		.67			
DO TASK ANALYSIS		.64			
DEVELOP CURRICULA		.87			
DESIGN/REVISE COURSES AND CURRICULA		.86			
DEVELOP TRAINING MATERIALS AND AIDS		.60			
MONITOR DEVELOPMENTS IN TRAINING TECHNOLOGY			.69		
SELECT INSTRUCTIONAL DELIVERY SYSTEMS			.73		
DEVELOP/CONDUCT INSERVICE TRAINING			.60		
MAINTAIN CENTRAL TECHNICAL LIBRARY					.89
PREPARE EXAMINATIONS	.73				
ANALYZE TEST DATA	.77				
MAINTAIN TEST ITEM BANK	.82				
DEVELOP INTERNAL FEEDBACK INSTRUMENTS	.65				
DEVELOP ITEMS FOR EXTERNAL FEEDBACK	.55				
ANALYZE AND INTERPRET FEEDBACK DATA	.65				
STUDY ATTRITION	.61				

TABLE D-1. VARIMAX ROTATED FACTOR LOADINGS OF DEGREE OF INVOLVEMENT WITH FUNCTIONS (continued)

FUNCTIONS	FACTORS				
	EVAL1	CISWRK	CISDEV	EVAL2	TECLIB
STUDY SETBACKS	.57				
ADMINISTER STUDENT CRITIQUE PROGRAM	.56				
EVALUATE INSTRUCTORS				.64	
EVALUATE INSERVICE PROGRAMS			.43		
CONDUCT ANNUAL COURSE REVIEWS				.60	
CONDUCT SPECIAL RESEARCH PROJECTS			.52		

TYPES OF CISOS

In order to determine if there are different types of CISOs with respect to functions performed, discriminant function analysis (Nunnally, 1978) using the three CISO-level scales, CISDEV, EVAL2, and TECLIB, was chosen. The school was the dependent variable. Three functions were extracted and rotated using the VARIMAX criterion. The first function, on which TECLIB loads highest, is significant at the .0001 level, indicating that it provides a great deal of discriminatory information. The second function, representing primarily the scale EVAL2, is also significant ($p = .0059$). The third function, representing CISDEV, is significant at the .10 level. Although this is lower than the traditional standard of .05, the third function is used for discrimination because it still contains some discriminatory information. The 29 school scores on the three discriminant functions are presented in table D-2. Schools that have similar scores on all three functions can be considered similar in terms of the degree of involvement with the functions represented in the three scales, CISDEV, EVAL2, and TECLIB. A visual inspection of the scores resulted in the six clusters of CISOs shown in table 6 in section IV.

TABLE D-2. CANONICAL SCORES FOR 29 CISOs ON THREE DISCRIMINANT FUNCTIONS

CISO	FUNCTION 1 TECLIB	FUNCTION 2 EVAL2	FUNCTION 3 CISDEV
NATTC Memphis	-.28	-.87	.02
SERVSCOLCOM ORLANDO	.76	-.73	.36
NAVGMSCOL Dam Neck	.54	.75	2.23
FLECOMBATRACEN Dam Neck	.79	-.52	-.43
FLETRACEN Norfolk	.09	-.20	-.26
FLEASWTRACENLANT Norfolk	1.03	-.90	-.89
NAVPHIBSCOL Little Creek	.90	.38	-1.12
SWOSCOLCOM Newport	-.61	-.84	.15
NETC Newport	.79	-.20	.05
NAVDIVESALVTRACEN Panama City	.44	1.03	.69
NAVTECHTRACEN Corry Station	-.77	-.35	.58
NAVSUBSCOL New London	-.25	-.36	.03
NATTC Lakehurst	.13	1.14	-.26
NAVSCOLCECOFF Pt Hueneme	.27	.95	1.58
SERVSCOLCOMDET Chanute AFB	1.10	.09	1.63
FLEASWTRACENPAC San Diego	-.54	.11	-.26
NAVSUBTRACENPAC Pearl Harbor	-.09	.70	-.59
NAVSCOLEOD Indian Head	-.38	-.05	-.55
SERVSCOLCOM San Diego	-.18	.33	.13
SERVSCOLCOM Great Lakes	.98	1.25	.20
NAVSCOLTRANSMAN Oakland	1.62	.73	2.19
NAVDAMCONTRACEN Philadelphia	1.84	.62	-.65

TABLE D-2. CANONICAL SCORES FOR 29 CISOs ON THREE DISCRIMINANT FUNCTIONS (continued)

CISO	FUNCTION 1 TECLIB	FUNCTION 2 EVAL2	FUNCTION 3 CISDEV
NAVTECHTRACEN Meridian	-.66	-.08	1.63
FLECOMBATRACEN San Diego	-1.01	1.11	.74
SUBTRAFAC San Diego	-.75	.76	-.31
NAVTECHTRACEN Treasure Island	1.65	-.49	.22
COMBATSYSTECHSCOL Mare Island	-.88	.48	.54
NAVPHIBSCOL Coronado	-.44	.59	.63
NAMTRAGRU Memphis	-.42	-.50	.31

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